# EventGrid

# User Guide

**Issue** 01

**Date** 2024-09-06

**HUAWEI CLOUD COMPUTING TECHNOLOGIES CO., LTD.**

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# 1 Getting Started with EG

EventGrid (EG) is a serverless event bus service for standard and centralized access of Huawei Cloud services and custom or SaaS applications. You can build a loosely coupled, distributed event-driven architecture to flexibly route events via CloudEvents.

## Prerequisites

1. You have **registered a HUAWEI ID and enabled Huawei Cloud services**.
2. Your account has permission to use EG. For details about how to authorize an account and bind permissions to it, see **Creating a User and Granting EG Permissions**.

## Logging In to the EG Console

**Step 1** Log in to Huawei Cloud console.

**Step 2** Click and select a region.

**Step 3** Click in the upper left, and choose EventGrid from the service list to go to the EG console.

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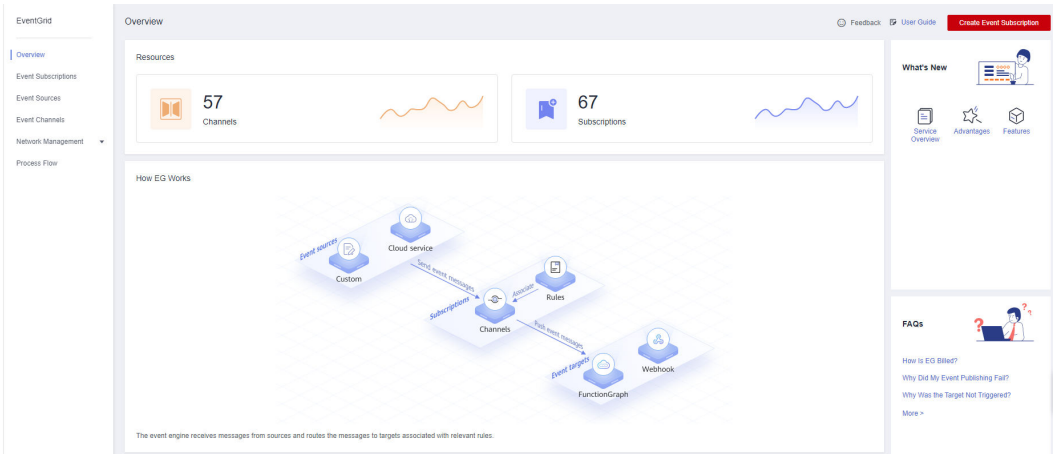
**Figure 1-1** EG console




**----End**

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# 2 Permissions Management

## 2.1 Creating a User and Granting EG Permissions

This section describes how to use **Identity and Access Management (IAM)** to implement fine-grained permissions control for your EG resources. With IAM, you can:

- Create IAM users for employees based on the organizational structure of your enterprise. Each IAM user has their own security credentials to access EG resources.
- Grant only the permissions required for users to perform a specific task.
- Entrust an account or cloud service to perform professional and efficient O&M on your EG resources.

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

This section describes the procedure for granting permissions (see **Figure 2-1**).

### Prerequisites

Learn about the permissions (see **System-defined roles and policies supported by EG**) supported by EG and choose policies according to your requirements.

For the permissions of other services, see **System Permissions**.

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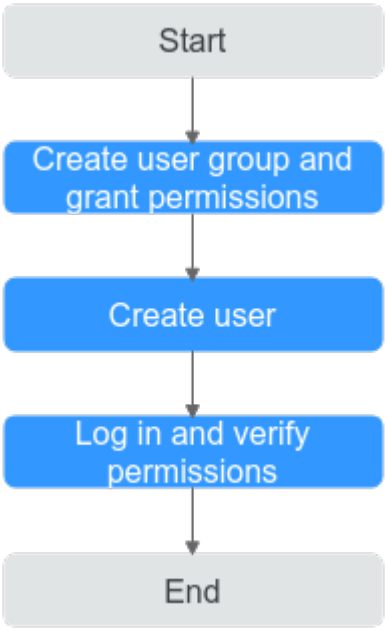
### Process Flow

**Figure 2-1** Process for granting EG permissions




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

   Create a user group on the IAM console, and assign it the read-only permissions for EG.

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

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

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

   Log in to the EG console as the created user, and verify that the user only has read permissions for EG.

## 2.2 Custom Policies

Custom policies can be created to supplement the system-defined policies of EG.

You can create custom policies in either of the following ways:

- Visual editor: Select cloud services, actions, resources, and request conditions. This does not require knowledge of policy syntax.
- JSON: Edit policies from scratch or based on an existing policy in JSON format.

For details, see **Creating a Custom Policy**. The following section contains examples of common EG custom policies.

### Example Custom Policies

- Example 1: Allow user to delete event sources

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```
{
   "Version": "1.1",
   "Statement": [
      {
         "Effect": "Allow",
         "Action": [
            "
                eg:sources:delete
                eg:sources:list
             "
         ]
      }
   ]
}
```

- Example 2: Deny event source deletion

  A policy with only "Deny" permissions must be used in conjunction with other policies to take effect. If the permissions assigned to a user include both "Allow" and "Deny", the "Deny" permissions take precedence over the "Allow" permissions.

  The following method can be used if you need to assign permissions of the **EG FullAccess** policy to a user but also forbid the user from deleting event sources. Create a custom policy to disallow event source deletion and assign both policies to the group the user belongs to. Then the user can perform all operations on EG except deleting event sources. The following is an example of a deny policy:

```
{
      "Version": "1.1",
      "Statement": [
            {
                  "Effect": "Deny",
                  "Action": [
                        "eg:sources:delete"
                  ]
            }
      ]
}
```

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# 3 Event Sources

## 3.1 Introduction

Event sources include Huawei Cloud services, custom applications, and SaaS applications. They produce events and publish them to EG.

EG supports the following event sources:

- Cloud service: Huawei Cloud services publish specific types of events to EG through predefined channels. The events are filtered with rules and then routed to targets. For details about the supported cloud service event sources, see **Cloud Service Event Sources**.
- Custom
  - Custom applications publish events to EG through custom channels. The events are filtered with rules and then routed to targets.
  - Custom event sources include DMS for RabbitMQ and DMS for RocketMQ.

**CAUTION**

EG does not encrypt the information in event sources. If your events contain sensitive information, encrypt it for security.

## 3.2 Cloud Service Event Sources

This section describes the cloud service event sources supported by EG, and depicts how to view their predefined event types.

### Cloud Service Event Source List

The following table lists the cloud service event sources supported by EG.

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**Table 3-1** Cloud service event sources

| | | | |
|---|---|---|---|
| Cloud Application Engine (CAE) | Database and Application Migration (UGO) | Classroom | Content Moderation |
| Virtual Private Cloud (VPC) | CodeCheck | GaussDB NoSQL | API Gateway (APIG) |
| Data Warehouse Service (DWS) | CloudDeploy | Identity and Access Management (IAM) | EventGrid (EG) |
| Huawei Cloud Ubiquitous Cloud Native Service (UCS) | Scalable File Service (SFS) | CloudIDE | Face Recognition Service (FRS) |
| Cloud Service Engine (CSE) | Direct Connect | Data Lake Visualization (DLV) | NAT Gateway |
| Workspace | IoT Device Access (IoTDA) | Distributed Message Service (DMS) | Knowledge Graph (KG) |
| IoT Edge | Log Tank Service (LTS) | CloudBuild | Object Storage Migration Service (OMS) |
| Cloud Backup and Recovery (CBR) | Message & SMS (MSGSMS) | Elastic IP (EIP) | Cloud Trace Service (CTS) |
| Cloud Search Service (CSS) | Video Analysis Service (VAS) | Data Admin Service (DAS) | Bare Metal Server (BMS) |
| CloudTest | VPC Endpoint (VPCEP) | Cloud Storage Gateway (CSG) | Virtual Private Network (VPN) |
| Enterprise Router (ER) | Recommender System (RES) | Cloud Server Backup Service (CSBS) | Content Delivery Network (CDN) |
| Container Guard Service (CGS) | Situation Awareness (SA) | CodeHub | CloudTable |
| Volume Backup Service (VBS) | CloudSite | Cloud Phone (CPH) | Cloud Performance Test Service (CPTS) |
| Intelligent EdgeCloud (IEC) | FunctionGraph | Server Migration Service (SMS) | Tag Management Service (TMS) |
| Conversational Bot Service (CBS) | Relational Database Service (RDS) | Domain Name Service (DNS, Region) | Storage Disaster Recovery Service (SDRS) |

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| | | | |
|---|---|---|---|
| Voice Call | Application Performance Management (APM) | Application Orchestration Service (AOS) | Data Ingestion Service (DIS) |
| Database Security Service (DBSS) | HiLens | Cloud Data Migration (CDM) | Multi-Site High Availability Service (MAS) |
| CloudPipeline | Image Recognition | OBS Application Service | Object Storage Service (OBS) |
| Intelligent EdgeFabric (IEF) | SoftWare Repository for Container (SWR) | Distributed Cache Service (DCS) | Auto Scaling (AS) |
| Vulnerability Scan Service (VSS) | Graph Engine Service (GES) | Data Lake Insight (DLI) | Cloud Container Instance (CCI) |
| CodeArts Req | Document Database Service (DDS) | Data Replication Service (DRS) | ModelArts |
| Distributed Database Middleware (DDM) | Simple Message Notification (SMN) | ServiceStage | CodeArts |
| Blockchain Service (BCS) | Application Operations Management (AOM) | MapReduce Service (MRS) | Cloud Bastion Host (CBH) |
| Host Security Service (HSS) | Web Application Firewall (WAF) | Elastic Load Balance (ELB) | Elastic Volume Service (EVS) |
| ROMA Connect | Cloud Container Engine (CCE) | Image Management Service (IMS) | Elastic Cloud Server (ECS) |

**NOTE**

Currently, only write events are supported. Read events are not supported.

## Viewing Event Types

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

**Step 2** In the navigation pane, choose **Event Sources**.

**Step 3** On the **Cloud Service** tab, click the desired event source.

**Step 4** View the event types and description in the **Event Types** area, as shown in **Figure 3-1**.

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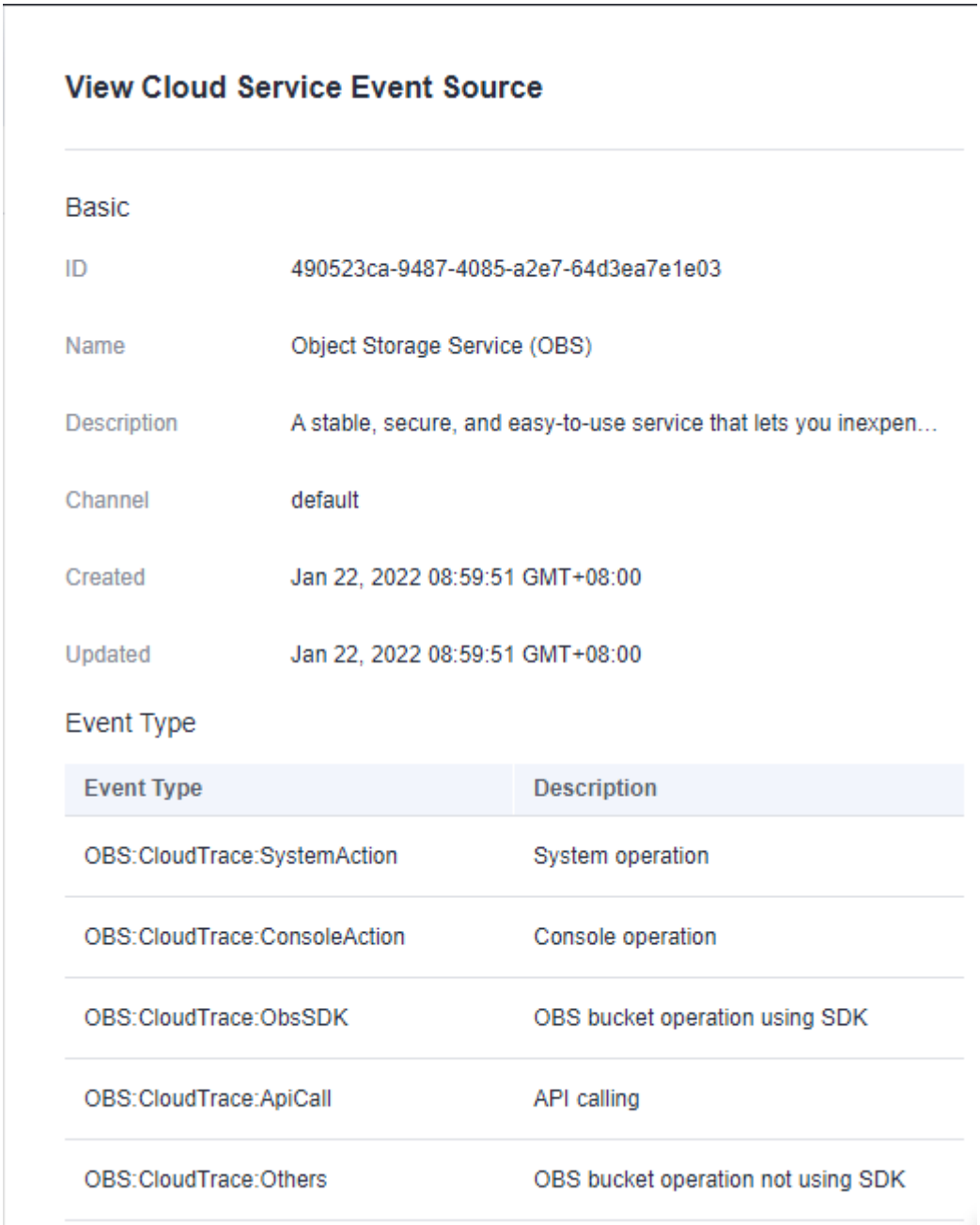
**Figure 3-1** Event types




**----End**

# 3.3 Creating an Event Source

## 3.3.1 Custom Application

Create a custom application event source.

### Prerequisites

(Optional) You have **created an event channel**.

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## Procedure

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

**Step 2** In the navigation pane, choose **Event Sources**.

**Step 3** Click **Create Event Source**.

**Step 4** Set event source information by referring to **Table 3-2**.

**Table 3-2** Custom application event source parameters

| Parameter | Description |
| --- | --- |
| Name | Event source name.<br>The name cannot be modified once the event source is created. |
| Description | Describe the event source. |
| Type | Select **Custom application**. |

**Step 5** Click **OK**.

View this event source on the **Custom** tab.

NOTE

- Only the event source description can be modified. To modify it, click **Edit** in the row that contains the desired event source.
- To view details about a custom event source, click its name in the custom event source list.
- If the event source is new (unavailable in the event source list), the monitoring information cannot be queried on the Cloud Eye console after the event delivery.

**----End**

## Follow-Up Procedure

(Optional) **Creating an Event Subscription**

# 3.3.2 DMS for RocketMQ

Create a DMS for RocketMQ event source.

## Prerequisites

- (Optional) You have **created an event channel**.
- You have purchased a DMS for RocketMQ instance. The instance contains topics and is in the **Running** state. For details, see **Buying an Instance**.
- You have **created a private endpoint** with the same VPC and subnet as the RocketMQ instance.
- You have configured the **default** security group with rules for the RocketMQ instance. For details, see **How Do I Configure a Security Group for an Event Source?**

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## Creating a RocketMQ Event Source

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

**Step 2** In the navigation pane, choose **Event Sources**.

**Step 3** Click **Create Event Source**.

**Step 4** Set event source information by referring to **Table 3-3**.

**Table 3-3** RocketMQ event source parameters

| Parameter | Description |
| --- | --- |
| Type | Two types are available:<br>• **Existing**: Select an existing custom event channel.<br>• **New**: Create an event channel. |
| Channel | • If **Type** is set to **Existing**, select an existing custom event channel.<br>• If **Type** is set to **New**, enter a channel name and description.<br>The channel cannot be modified once the event source is created. |
| Name | Event source name.<br>The name cannot be modified once the event source is created. |
| Description | Describe the event source. |
| Type | Select **DMS for RocketMQ**.<br>**NOTE**<br>You will be prompted to create an agency when creating your first DMS for RocketMQ event source. For details, see **Authorization**. |
| Instance | Select a RocketMQ instance.<br>**Self-hosted RocketMQ** indicates your own RocketMQ. |
| Topic | Topic of the RocketMQ instance. |
| Consumer Group | Consumer group of the RocketMQ instance. |
| Username | Required if ACL has been enabled for the RocketMQ instance. |
| Secret Key | Required if ACL has been enabled for the RocketMQ instance. |
| VPC | Available only when you selected **Self-hosted RocketMQ** for **Instance**. |
| Subnet | Available only when you selected **Self-hosted RocketMQ** for **Instance**. |
| Connection Address | Available only when you selected **Self-hosted RocketMQ** for **Instance**. Enter the connection address of your own RocketMQ. |

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| Parameter | Description |
| --- | --- |
| SSL | Available only when you selected **Self-hosted RocketMQ** for **Instance**. Specify whether to enable SSL.<br>**NOTE**<br>SSL cannot be modified if your RocketMQ is running. But you can delete the event source and configure it again with SSL setting. |
| ACL | Available only when you selected **Self-hosted RocketMQ** for **Instance**. Specify whether to enable ACL. |

**Step 5** Click **OK**.

View this event source on the **Custom** tab.

NOTE

- Only the event source description can be modified. To modify it, click **Edit** in the row that contains the desired event source.
- To view details about a custom event source, click its name in the custom event source list.

**----End**

## Follow-Up Procedure

(Optional) **Creating an Event Subscription**

# 3.4 Deleting a Custom Event Source

Delete a custom event source that will no longer be used.

## Procedure

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

**Step 2** In the navigation pane, choose **Event Sources**.

**Step 3** On the **Custom** tab, click **Delete** in the row that contains the desired event source.

**Step 4** Click **Yes**.

**----End**

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# 4 Event Channels

## 4.1 Introduction

Event channels receive events from event sources.

EG supports the following event channels:

- Cloud service: A channel automatically created by EG to receive events from cloud services. This channel cannot be modified. **Events generated by cloud service event sources can only be published to this channel.**
- Custom: Channels you create to receive events from custom sources.

## 4.2 Creating an Event Channel

Create a custom event channel.

### Procedure

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

**Step 2** In the navigation pane, choose **Event Channels**.

**Step 3** Click **Create Event Channel**.

**Step 4** Enter a channel name and description, and click **OK**. The following table describes the parameters.

**Table 4-1** Parameters for creating a custom event channel

| Parameter | Description |
| --- | --- |
| Channel | Enter a channel name. |
| Description | Describe the channel. |

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| Parameter | Description |
| --- | --- |
| Enterprise Project | Select an enterprise project.<br>**NOTE**<br>This cannot be changed once specified. |
| Cross-Account | Whether to receive events from specified accounts.<br>**NOTE**<br>Once enabled, you can specify accounts from which you want to receive events.<br>When creating a channel, you need to enable the cross-account function and enter the ID of the target account.<br>The cross-account function also needs to be enabled if the same account is used in different regions. |
| Account ID | Enter IDs of authorized accounts, and separate the IDs with commas (,).<br>**NOTE**<br>Enter a maximum of three account IDs and separate them with commas. Example: **account1,account2** |
| Policy | <pre>{<br>"Sid": "allow_account_to_put_events",<br>"Effect": "Allow",<br>"Principal": {<br>"IAM": []<br>},<br>"Action": "eg:channels:putEvents",<br>"Resource": "urn:eg:cn-north-7:eeb7f0f587674635a3669e1d63013316:channel:"<br>}</pre>**NOTE**<br>The policy is read-only and cannot be edited. |

View this channel in the **Custom** area.

NOTE

- Only the event channel description can be modified. To modify it, click **Edit** in the row that contains the desired event channel.
- To view details about a custom event channel, click its name in the custom event channel list.

**----End**

# 4.3 Deleting a Custom Event Channel

Delete an event channel that will no longer be used.

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### Procedure

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

**Step 2** In the navigation pane, choose **Event Channels**.

**Step 3** Click **Delete** in the row that contains the desired event channel.

NOTE

If the event channel to delete is associated with sources and subscriptions, disassociate it first.

**Step 4** Click **Yes**.

**----End**

## 4.4 Publishing Events

Publish events to a channel.

By publishing events, check whether an event source, channel, and target have been connected, whether the configured rules are valid, and whether events can be sent to the target.

### Prerequisites

- You have **created an event channel**.
- You have created an **application event source**.
- You have configured an event target and **created an event subscription** with the preceding resources.

### Procedure

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

**Step 2** In the navigation pane, choose **Event Channels**.

**Step 3** Click **Publish Event**.

**Step 4** Configure the parameters described in the following table.

**Table 4-2** Parameters for publishing events

| Parameter | Description |
| --- | --- |
| Channel | Select a channel. |
| Source | Enter a custom application event source. |
| Event Type | Enter an event type. |
| Event Details | Enter event content in JSON format. |
| Timestamp | Select a timestamp. |

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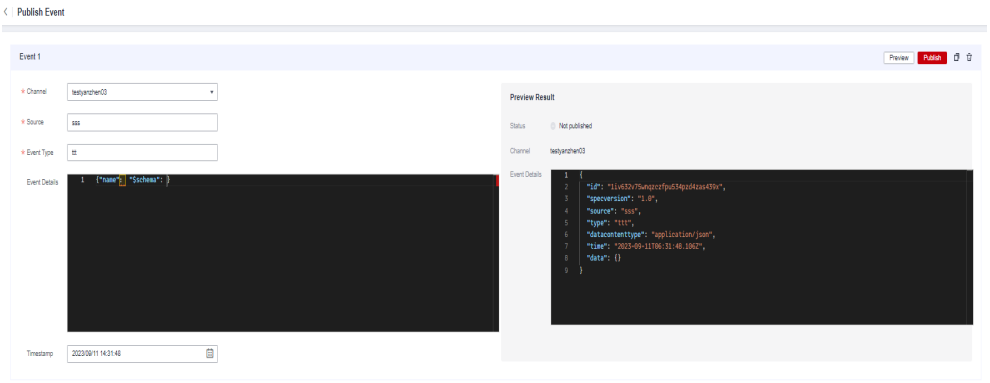
**Step 5** Click **Preview** to preview the event.

**Step 6** Click **Publish**. If the event is successfully published, a result similar to that in Figure 4-1 is displayed.

**Figure 4-1** Publishing an event




NOTE

- To publish more events, click **Add Event**.
- You can publish one or more events at a time.
- To clone an event, click .
- To delete an event, click .
- Each event cannot exceed 64 KB.

**----End**

# 4.5 Monitoring

**Event channel monitoring is supported in these regions: CN East-Shanghai1, CN East-Shanghai2, and CN North-Beijing4.**

## 4.5.1 Viewing Monitoring Data

### Scenario

Cloud Eye monitors event channel metrics in real time. You can view these metrics on the Cloud Eye console.

### Prerequisites

You have created an event channel.

### Procedure

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

**Step 2** Click in the upper left and select a region.

NOTE

Select the region where your event channel is located.

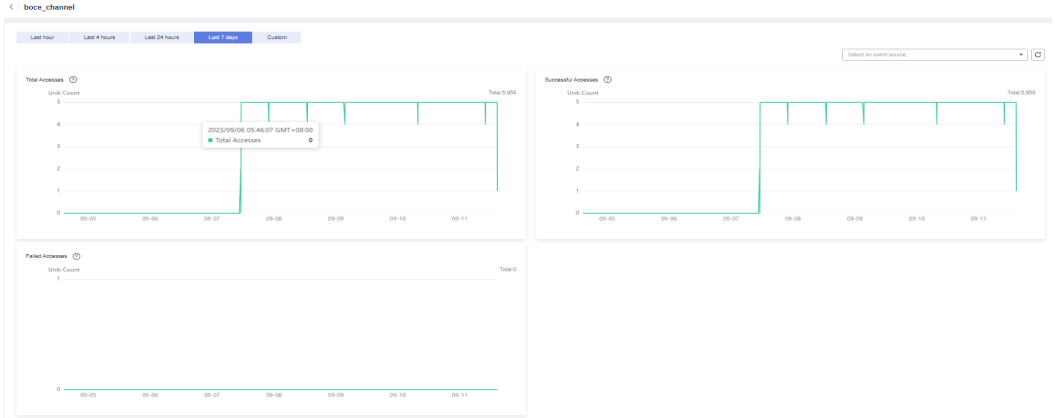
**Step 3** Click ☰ in the upper left and choose **Middleware** > **EventGrid**.

**Step 4** Choose **Event Channels**.

**Step 5** Click in the row that contains the target event channel to go to the monitoring page. Data of all accessed events in the last hour is displayed by default.

You can also click **1h**, **3h**, **12h**, **1d**, **7d**, or **30d** to view event accesses in different periods.

**Figure 4-2** Viewing event channel monitoring data




NOTE

To customize a time range, click .

If you enable **Auto Refresh**, the metric data is refreshed every 5 seconds.

Click **View details** to go to the Cloud Eye console.

If you set **Period** to **Raw data**, the raw monitoring data is displayed. If you set **Period** to a specific time, you can select different aggregation methods, including **Avg.**, **Max.**, **Min.**, **Sum**, and **Variance**.

**----End**

# 4.5.2 Supported Metrics

## Introduction

This section describes the event channel metrics and dimensions reported to Cloud Eye. You can search metrics and alarms on the Cloud Eye console or on the monitoring page of EG.

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## Metrics

**Table 4-3** Metric description

| ID | Name | Description | Value Range | Monitored Object | Raw Data Monitoring Period (Minute) |
|---|---|---|---|---|---|
| pub_num | Total Accesses | Number of times event access is attempted. | ≥ 0 | Event channel | 1 |
| pub_success_num | Successful Accesses | Number of times events are actually accessed. | ≥ 0 | Event channel | 1 |
| pub_success_rate | Success Rate | Percentage of total accesses that are successful. | 0%–100% | Event channel | 1 |
| pub_failed_num | Failed Accesses | Number of times events could not be accessed. | ≥ 0 | Event channel | 1 |
| pub_failed_rate | Failure Rate | Percentage of total accesses that failed. | 0%–100% | Event channel | 1 |
| pub_process_time | Processing Time | Average time spent processing an event access. | ≥ 0 ms | Event channel | 1 |

**Table 4-4** Dimension description

| Dimension | Key | Value |
|---|---|---|
| Event channel | channel_id | Event channel ID |

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# 5 Event Subscriptions

## 5.1 Creating an Event Subscription

Event subscriptions bind event sources, channels, and targets, and route events of sources to targets based on specified rules.

A subscription can be bound with up to five targets.

### Prerequisites

- (Optional) You have **created an event source**.
- You have set an event target.

### Procedure

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

**Step 2** In the navigation pane, choose **Event Subscriptions**.

**Step 3** Click **Create Event Subscription**.

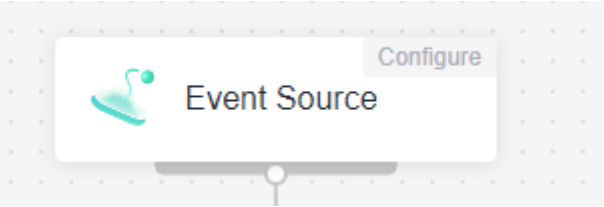
**Step 4** Click next to the default subscription name.

**Step 5** Enter a new subscription name and description, and click **OK**.

**Step 6** Configure an event source.

1. Click **Event Source**, as shown in **Figure 5-1**.

   **Figure 5-1** Configuring an event source

2. Select an event source provider.

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- **Huawei Cloud**: Huawei Cloud service event source
- **Custom**: custom event source

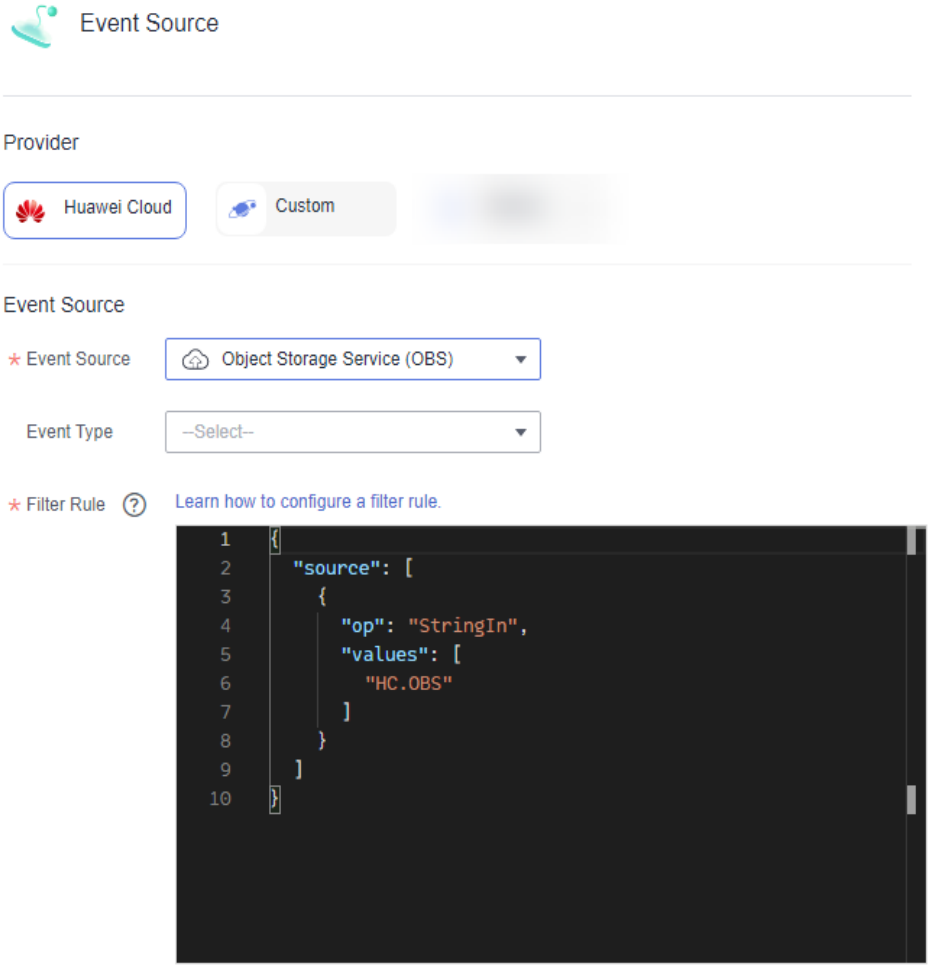
3. Set event source parameters.

   When selecting **Huawei Cloud**, set the parameters listed in **Table 5-1**.

**Table 5-1** Cloud service event source parameters

| Parameter | Description |
| --- | --- |
| Event Source | Select a cloud service event source. |
| Event Type | (Optional) Select a predefined event type. |
| Filter Rule | Enter an event filter rule.<br>Only events that match these filter rules will be routed to the associated targets. For more information about filter rules, see **Filter Rule Parameters** and **Example Filter Rules**. |

**Figure 5-2** Configuring a cloud service event source

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If **Event Source** is set to **OBS Application Service**, refer to **Table 5-2**.

**Table 5-2** OBS application event source parameters

| Parameter | Description |
| --- | --- |
| Source | Select an event source. |
| Bucket | Select an OBS bucket. |
| Event Type | Select event types to filter. |
| Object Name Prefix | Enter an object name prefix. |
| Object Name Suffix | Enter an object name suffix. |
| Object Name Encoding | Whether to encode object names of OBS events. |
| Filter Rule | Enter an event filter rule.<br>Only events that match these filter rules will be routed to the associated targets. For more information about filter rules, see **Filter Rule Parameters** and **Example Filter Rules**. |

When selecting **Custom**, set the parameters listed in **Table 5-3**.

**Table 5-3** Custom event source parameters

| Parameter | Description |
| --- | --- |
| **Channel** | |
| Type | Two types are available:<br>– **Existing**: Select an existing custom event channel.<br>– **New**: Create an event channel. |
| Channel | – If **Type** is set to **Existing**, select an existing custom event channel, for example, **channel**.<br>– If **Type** is set to **New**, enter a channel name. |
| Description | Set this parameter only when **Type** is set to **New**.<br>Describe the custom event channel. |
| **Event Source** | |
| Type | Two types are available:<br>– **Existing**: Select an existing custom event source.<br>– **New**: Create an event source. |

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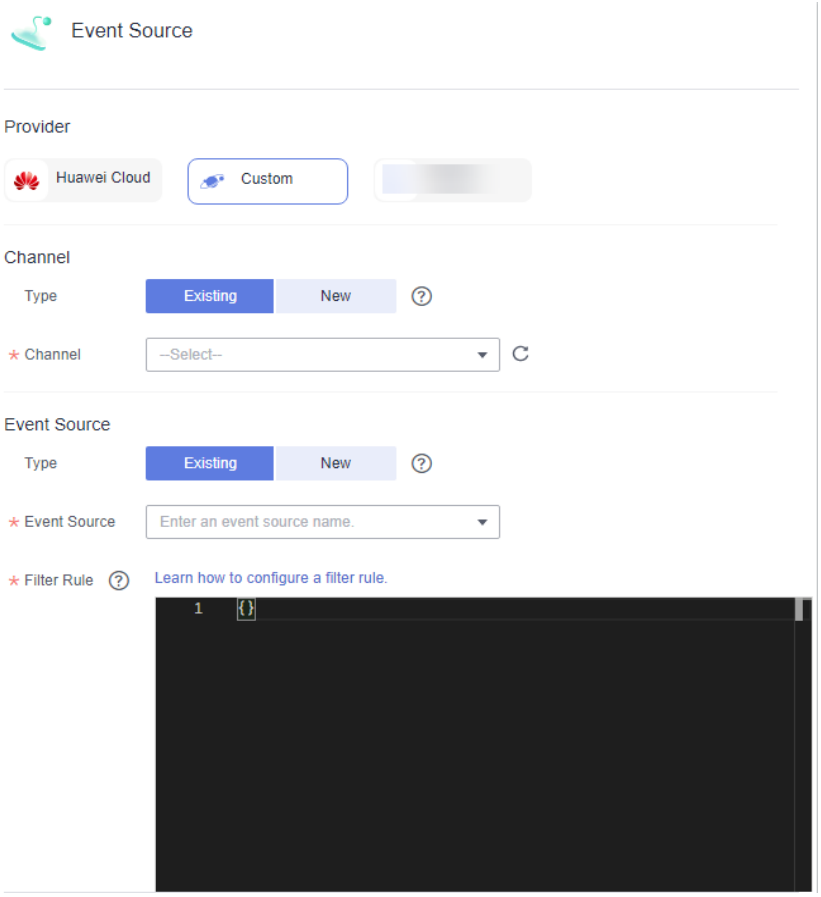
| Parameter | Description |
| --- | --- |
| Event Source | – If **Type** is set to **Existing**, select a custom event source associated with the custom event channel you specify, for example, **channel**.<br>– If **Type** is set to **New**, enter a source name. |
| Description | Set this parameter only when **Type** is set to **New**.<br>Describe the custom event source. |
| Filter Rule | Enter an event filter rule.<br>Only events that match these filter rules will be routed to the associated targets. For more information about filter rules, see **Filter Rule Parameters** and **Example Filter Rules**. |

**Figure 5-3** Configuring a custom event source




4. Click **OK**.

**Step 7** Configure an event target.

NOTE

A subscription can be bound with up to five targets.

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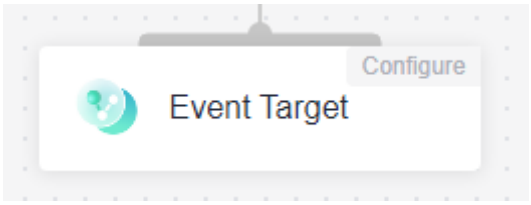
1. Click **Event Target**, as shown in **Figure 5-4**.

   **Figure 5-4** Configuring an event target

2. Select an event target provider.
   - **Huawei Cloud**: Huawei Cloud service event target
   - **Custom**: custom event target
3. Set event target parameters.

   When selecting **Huawei Cloud**, set the following parameters.
   - **Event Target**: Select an event target.

     If you set **Event Target** to **FunctionGraph (function computing)**:
     - **Function**: Select the function to trigger. If no function is available, create one by referring to section "Creating a Function".
     - **Version/Alias**: Choose to specify a version or alias.
     - **Version**: Select a version of the function. By default, **latest** is selected.
     - **Alias**: Select an alias of the function.
     - **Execute**: Select **Asynchronously** or **Synchronously**.

       NOTE

       Function invocation mode. Default: **Asynchronously**.

       **Asynchronously**: Immediate responses of function invocation are not required.

       **Synchronously**: Immediate responses of function invocation are required.
     - **Agency**: Select an agency. If no agency is available, click **Create Agency** to generate one named **EG_TARGET_AGENCY**.
       1) Only agencies with EG as the delegated cloud service are displayed.
       2) Select an agency with the permission **functiongraph:function:invoke***.

     If you set **Event Target** to **Distributed Message Service (DMS) for Kafka**:
     - **Connection**: Select a **DMS for Kafka connection**.
     - **Topic**: Select a message topic.
     - **Enable**: Whether to enable the message key function.

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- **Transform Type**: Defines how message keys are used. There are two options:
  - **Variables**: Keys are variable values from CloudEvents-compliant events.
  - **Constants**: Keys are specified constants. All messages will be sent to the same partition.

  For more information about the transform types, see **Event Content Transformation**.

If you set **Event Target** to **EventGrid (EG)**:

NOTE

An event can be transmitted three times in an EG channel.

- **Account Type**: Select **Current** or **Other**. The following table lists the parameters.

**Table 5-4** Event target parameters

| Current | Other | Description |
| --- | --- | --- |
| Region | Region | CN North-Beijing4, CN East-Shanghai1, CN East-Shanghai2, and CN South-Guangzhou<br>**NOTE**<br>Coming soon in more regions. |
| Project ID | Project ID | Enter the project ID of the target channel.<br>**NOTE**<br>Enter the same project ID as the target channel, or events cannot be published to it.<br>Obtain the project ID on the **My Credentials** page of the corresponding account. |

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| Current | Other | Description |
| --- | --- | --- |
| Channel | Channel | Enter the target channel ID.<br>**NOTE**<br>Current account and same region: Select a channel in the current account. Other account: Specify a channel ID.<br>If you select **Current**, select a different channel from the subscription. Do not select the **default** channel.<br>When entering IDs across accounts, do not enter the same channel ID and default channel ID. Otherwise, the event cannot be delivered.<br>If the current channel is not associated with a subscription, messages published to the channel cannot be consumed. Therefore, you need to add a subscription. The event source name of the downstream event subscription must be the same as that of the upstream event subscription, and the downstream event source must be a user-defined event source. |

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| Current | Other | Description |
| --- | --- | --- |
| Agency | Agency | Select an agency.<br>**NOTE**<br>If no agency is available, click **Create Agency** to generate one named **EG_TARGET_AGENCY**.<br>Only agencies with EG as the delegated cloud service are displayed.<br>Select an agency with the permission **eg:channels:putEvents**. |

**Rule:**

- **Transform Type**: EG transforms CloudEvents-compliant events for targets.
  - **Pass-through**: Directly route CloudEvents-compliant events to the target.

  For more information about the transform types, see **Event Content Transformation**.

If you set **Event Target** to **Simple Message Notification (SMN)**:

- **Topic**: Select a message topic.
- **Agency**: Select an agency. If no agency is available, click **Create Agency** to generate one named **EG_SMN_PUBLISHER_AGENCY**.
  - Only agencies with EG as the delegated cloud service are displayed.
  - Select an agency with the permission **smn:topic:publish**.
- **Message Subject**: Configure the subject through constants or variables.
- **Type**: Type of the message subject. Two types are available:
  - **Constants**: The subject does not change from specified. All messages will use the same subject.
  - **Variables**: The subject in the template is a variable value from CloudEvents-compliant events. Max.: 512 characters.

    NOTE

    The **Subject** parameter is optional.

**Rule:**

- **Transform Type**: EG transforms CloudEvents-compliant events for targets. The following three types are supported:

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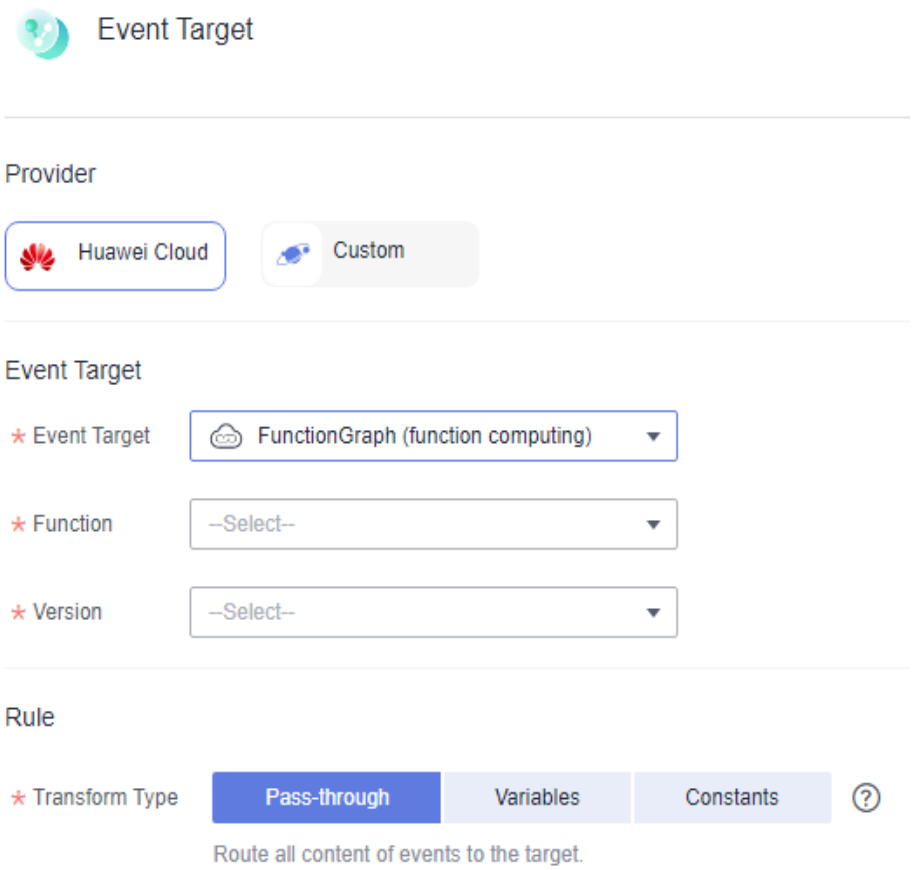
- **Pass-through**: Directly route CloudEvents-compliant events to the target.
- **Variables**: Route variables in CloudEvents-compliant events to the target.
- **Constants**: Route constants in events to the target.

For more information about the transform types, see **Event Content Transformation**.

**Figure 5-5** Configuring a Huawei Cloud service event target




When selecting **Custom**, set the following parameters.

- **URL**: Enter the URL of an event target.
- **Connection**: Select a custom or the default connection.
- **Headers Parameters**
  - Enter a request header.
  - Enter a value.

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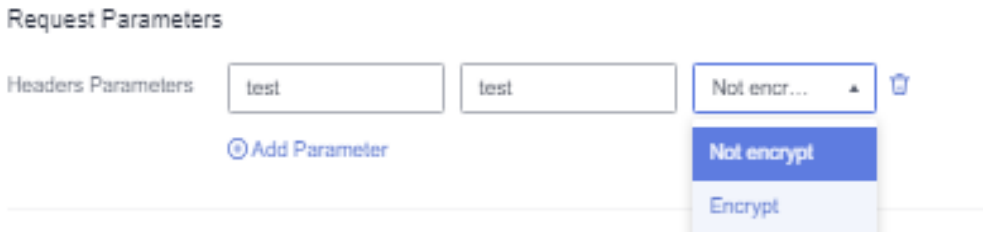
- Specify whether to encrypt the header.

  **Figure 5-6** Header parameters

  NOTE

  - For custom HTTPS events, add authorization configurations for the event target to improve security.
  - If the request header and value are invalid, the encryption option is unavailable.
  - **Key**: Max. 256 characters starting and ending with a letter. Only letters and hyphen (-) are allowed.
  - **Value**: Max. 1024 characters, including letters, hyphens (-), underscores (_), spaces, and special characters (~!@#$%^&*()=+|[{}];:'",<.>/?).

– **Transform Type**: EG transforms CloudEvents-compliant events for targets. The following three types are supported:

  - **Pass-through**: Directly route CloudEvents-compliant events to the target.
  - **Variables**: Route variables in CloudEvents-compliant events to the target.
  - **Constants**: Route constants in events to the target.

  For more information about the transform types, see **Event Content Transformation**.

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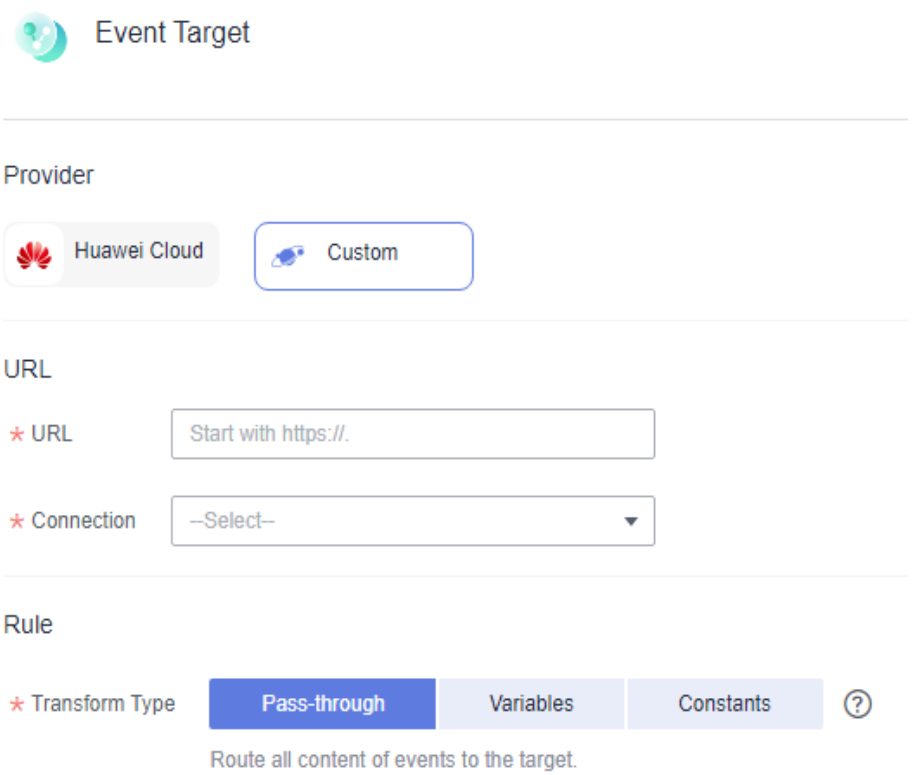
**Figure 5-7** Configuring a custom event target




4. Click **OK**.

**Step 8** Click **Save**.

The subscription is enabled by default once created.

**----End**

# 5.2 Editing an Event Subscription

Modify the description, status, event source, and event target of a subscription.

## Modifying the Description

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

**Step 2** In the navigation pane, choose **Event Subscriptions**.

**Step 3** Click **Configure** in the row that contains the desired subscription to go to the details page.

**Step 4** Click the edit icon next to the default subscription name.

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**Step 5** Modify the description and click **OK**.

**----End**

## Changing the Status

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

**Step 2** In the navigation pane, choose **Event Subscriptions**.

**Step 3** Click **Disable** or **Enable** in the row that contains the desired subscription.

**----End**

## Changing the Event Source

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

**Step 2** In the navigation pane, choose **Event Subscriptions**.

**Step 3** Click the name of the desired subscription to go to the details page.

**Step 4** Click the event source card.

**Step 5** Modify the event source parameters.

NOTE

The event source provider cannot be changed.

When selecting **Huawei Cloud**, set the parameters listed in **Table 5-5**.

**Table 5-5** Cloud service event source parameters

| Parameter | Description |
| --- | --- |
| Event Source | Select a cloud service event source. |
| Event Type | (Optional) Select a predefined event type. |
| Filter Rule | Enter an event filter rule.<br>Only events that match these filter rules will be routed to the associated targets. For more information about filter rules, see **Filter Rule Parameters** and **Example Filter Rules**. |

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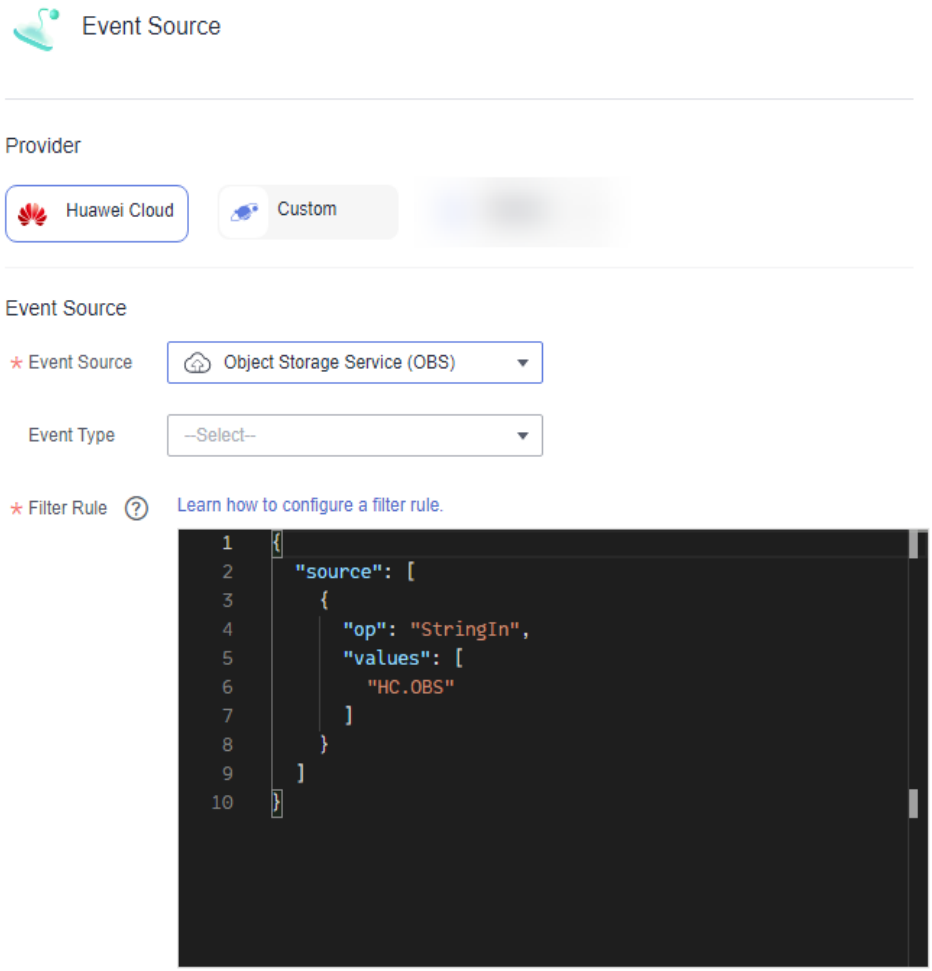
**Figure 5-8** Configuring a cloud service event source




When selecting **Custom**, set the parameters listed in **Table 5-6**.

NOTE

The bound custom event channel cannot be changed.

**Table 5-6** Custom event source parameters

| Parameter | Description |
| --- | --- |
| **Event Source** | |
| Type | Two types are available:<br>• **Existing**: Select a custom event source associated with the custom event channel.<br>• **New**: Create an event source. |
| Event Source | • If **Type** is set to **Existing**, select a custom event source associated with the custom event channel specified in the **Channel** area.<br>• If **Type** is set to **New**, enter a source name. |

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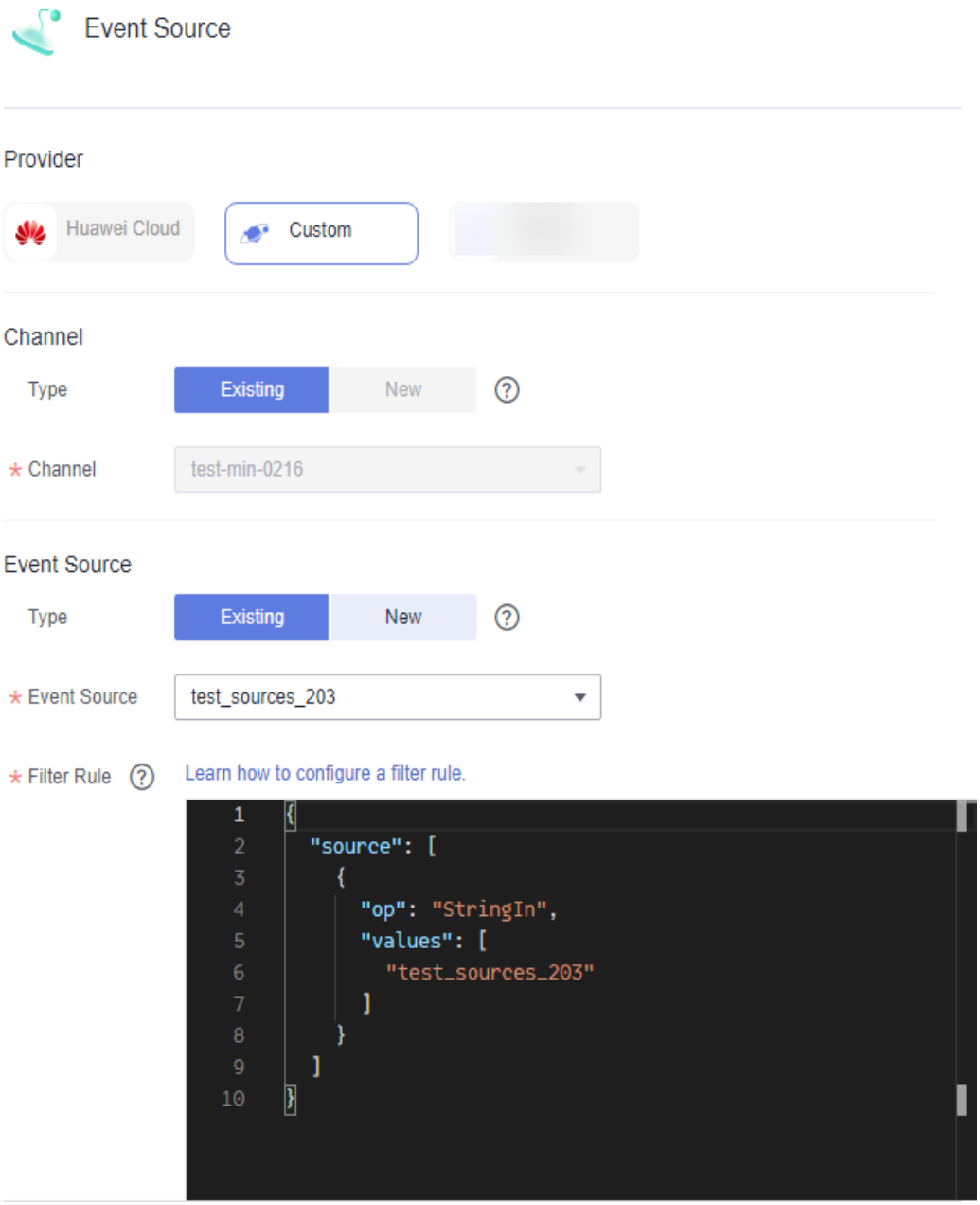
| Parameter | Description |
| --- | --- |
| Description | Set this parameter only when **Type** is set to **New**.<br>Describe the custom event source. |
| Filter Rule | Enter an event filter rule.<br>Only events that match these filter rules will be routed to the associated targets. For more information about filter rules, see **Filter Rule Parameters** and **Example Filter Rules**. |

**Figure 5-9** Configuring a custom event source

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**Step 6** Click **OK**.

**Step 7** Click **Save**.

**----End**

## Changing the Event Target

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

**Step 2** In the navigation pane, choose **Event Subscriptions**.

**Step 3** Click the name of the desired subscription to go to the details page.

**Step 4** Change the event target or add another one.

- Click the event target card to change the event target.
- Click ⊕ to add an event target.
- Click 🗑 to delete an event target.

**Step 5** Set the event target provider and relevant parameters.

When selecting **Huawei Cloud**, set the following parameters.

- **Event Target**: Select an event target.

  If you set **Event Target** to **FunctionGraph (function computing)**:

  - **Function**: Select the function to trigger. If no function is available, create one by referring to section "Creating a Function".
  - **Version/Alias**: Choose to specify a version or alias.
  - **Version**: Select a version of the function. By default, **latest** is selected.
  - **Alias**: Select an alias of the function.
  - **Execute**: Select **Asynchronously** or **Synchronously**.

    NOTE

    Function invocation mode. Default: **Asynchronously**.

    **Asynchronously**: Immediate responses of function invocation are not required.

    **Synchronously**: Immediate responses of function invocation are required.
  - **Agency**: Select an agency. If no agency is available, click **Create Agency** to generate one named **EG_TARGET_AGENCY**.

    i. Only agencies with EG as the delegated cloud service are displayed.

    ii. Select an agency with the permission **functiongraph:function:invoke***.

  If you set **Event Target** to **Distributed Message Service (DMS) for Kafka**:

  - **Connection**: Select a **DMS for Kafka connection**.
  - **Topic**: Select a message topic.
  - **Enable**: Whether to enable the message key function.
  - **Transform Type**: Defines how message keys are used. There are two options:

    - **Variables**: Keys are variable values from CloudEvents-compliant events.

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- **Constants**: Keys are specified constants. All messages will be sent to the same partition.

For more information about the transform types, see **Event Content Transformation**.

If you set **Event Target** to **EventGrid (EG)**:

NOTE

An event can be transmitted three times in an EG channel.

- **Account Type**: Select **Current** or **Other**. The following table lists the parameters.

**Table 5-7** Event target parameters

| Current | Other | Description |
| --- | --- | --- |
| Region | Region | CN North-Beijing4, CN East-Shanghai1, CN East-Shanghai2, and CN South-Guangzhou<br>**NOTE**<br>Coming soon in more regions. |
| Project ID | Project ID | Enter the project ID of the target channel.<br>**NOTE**<br>Enter the same project ID as the target channel, or events cannot be published to it.<br>Obtain the project ID on the **My Credentials** page of the corresponding account. |

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| Current | Other | Description |
| --- | --- | --- |
| Channel | Channel | Enter the target channel ID.<br>**NOTE**<br>Current account and same region: Select a channel in the current account. Other account: Specify a channel ID.<br>If you select **Current**, select a different channel from the subscription. Do not select the **default** channel.<br>When entering IDs across accounts, do not enter the same channel ID and default channel ID. Otherwise, the event cannot be delivered.<br>If the current channel is not associated with a subscription, messages published to the channel cannot be consumed. Therefore, you need to add a subscription. The event source name of the downstream event subscription must be the same as that of the upstream event subscription, and the downstream event source must be a user-defined event source. |
| Agency | Agency | Select an agency.<br>**NOTE**<br>If no agency is available, click **Create Agency** to generate one named **EG_TARGET_AGENCY**.<br>Only agencies with EG as the delegated cloud service are displayed.<br>Select an agency with the permission **eg:channels:putEvents**. |

**Rule:**

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- **Transform Type**: EG transforms CloudEvents-compliant events for targets.
  - **Pass-through**: Directly route CloudEvents-compliant events to the target.

  For more information about the transform types, see **Event Content Transformation**.

If you set **Event Target** to **Simple Message Notification (SMN)**:

- **Topic**: Select a message topic.
- **Agency**: Select an agency. If no agency is available, click **Create Agency** to generate one named **EG_SMN_PUBLISHER_AGENCY**.
  - Only agencies with EG as the delegated cloud service are displayed.
  - Select an agency with the permission **smn:topic:publish**.
- **Message Subject**: Configure the subject through constants or variables.
- **Type**: Type of the message subject. Two types are available:
  - **Constants**: The subject does not change from specified. All messages will use the same subject.
  - **Variables**: The subject in the template is a variable value from CloudEvents-compliant events. Max.: 512 characters.

    NOTE

    The **Subject** parameter is optional.

**Rule:**

- **Transform Type**: EG transforms CloudEvents-compliant events for targets. The following three types are supported:
  - **Pass-through**: Directly route CloudEvents-compliant events to the target.
  - **Variables**: Route variables in CloudEvents-compliant events to the target.
  - **Constants**: Route constants in events to the target.

  For more information about the transform types, see **Event Content Transformation**.

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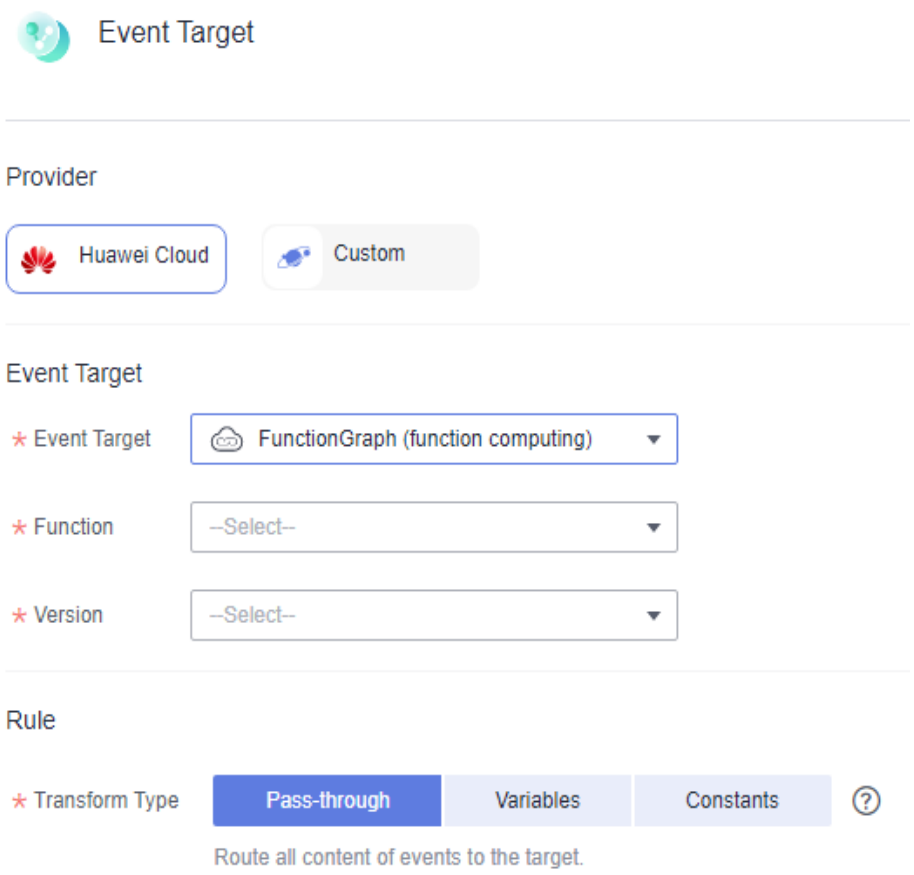
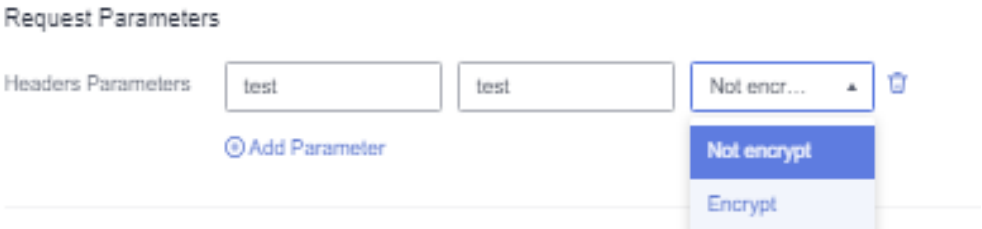
**Figure 5-10** Configuring a Huawei Cloud service event target




When selecting **Custom**, set the following parameters.

- **URL**: Enter the URL of an event target.
- **Connection**: Select a custom or the default connection.
- **Headers Parameters**
  - Enter a request header.
  - Enter a value.
  - Specify whether to encrypt the header.

  **Figure 5-11** Header parameters

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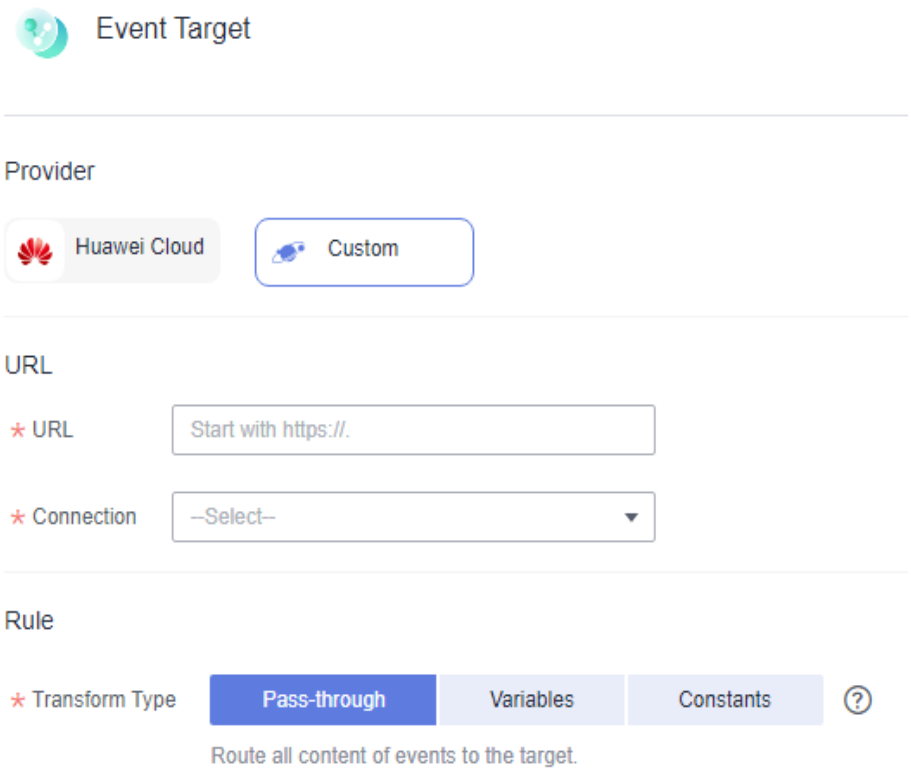
NOTE

- For custom HTTPS events, add authorization configurations for the event target to improve security.
- If the request header and value are invalid, the encryption option is unavailable.
- **Key**: Max. 256 characters starting and ending with a letter. Only letters and hyphen (-) are allowed.
- **Value**: Max. 1024 characters, including letters, hyphens (-), underscores (_), spaces, and special characters (~!@#$%^&*()=+|[{}];:'",<.>/?).

- **Transform Type**: EG transforms CloudEvents-compliant events for targets. The following three types are supported:
  - **Pass-through**: Directly route CloudEvents-compliant events to the target.
  - **Variables**: Route variables in CloudEvents-compliant events to the target.
  - **Constants**: Route constants in events to the target.

  For more information about the transform types, see **Event Content Transformation**.

**Figure 5-12** Configuring a custom event target

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**Step 6** Click **OK**.

**Step 7** Click **Save**.

**----End**

# 5.3 Deleting an Event Subscription

Delete an event subscription that will no longer be used.

## Procedure

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

**Step 2** In the navigation pane, choose **Event Subscriptions**.

**Step 3** Click **Delete** in the row that contains the desired event subscription.

**Step 4** Click **Yes**.

**----End**

# 5.4 Monitoring

**Event subscription monitoring is supported in these regions: CN East-Shanghai1, CN East-Shanghai2, and CN North-Beijing4.**

## 5.4.1 Viewing Monitoring Data

### Scenario

Cloud Eye monitors event subscription metrics in real time. You can view these metrics on the Cloud Eye console.

### Prerequisites

You have created an event subscription.

### Procedure

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

**Step 2** Click in the upper left and select a region.

NOTE

Select the region where your event subscription is located.

**Step 3** Click in the upper left and choose **Middleware** > **EventGrid**.

**Step 4** Choose **Event Subscriptions**.

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**Step 5** Click in the row that contains the target event subscription to go to the monitoring page. Data of all delivered events in the last hour is displayed by default.

You can also click **1h**, **3h**, **12h**, **1d**, **7d**, or **30d** to view event deliveries in different periods.

NOTE

To customize a time range, click .

If the event subscription has multiple targets, select one to view its monitoring data. By default, the monitoring data of all targets is displayed.

If you enable **Auto Refresh**, the metric data is refreshed every 5 seconds.

Click **View details** to go to the Cloud Eye console.

If you set **Period** to **Raw data**, the raw monitoring data is displayed. If you set **Period** to a specific time, you can select different aggregation methods, including **Avg.**, **Max.**, **Min.**, **Sum**, and **Variance**.

**----End**

# 5.4.2 Supported Metrics

## Introduction

This section describes the event subscription metrics and dimensions reported to Cloud Eye. You can search metrics and alarms on the Cloud Eye console or on the monitoring page of EG.

## Metrics

**Table 5-8** Metric description

| ID | Name | Description | Value Range | Monitored Object | Raw Data Monitoring Period (Minute) |
|---|---|---|---|---|---|
| sub_num | Total Deliveries | Number of times event delivery is attempted. | ≥ 0 | Event subscription | 1 |
| sub_success_num | Successful Deliveries | Number of times events are actually delivered. | ≥ 0 | Event subscription | 1 |

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| ID | Name | Description | Value Range | Monitored Object | Raw Data Monitoring Period (Minute) |
|---|---|---|---|---|---|
| sub_success_rate | Success Rate | Percentage of total deliveries that are successful. | 0%–100% | Event subscription | 1 |
| sub_failed_num | Failed Deliveries | Number of times events could not be delivered. | ≥ 0 | Event subscription | 1 |
| sub_failed_rate | Failure Rate | Percentage of total deliveries that failed. | 0%–100% | Event subscription | 1 |
| sub_retry_num | Delivery Retries | Number of times delivery retry is attempted. | ≥ 0 | Event subscription | 1 |
| sub_retry_rate | Retry Rate | Percentage of total deliveries that are retried. | 0%–100% | Event subscription | 1 |
| sub_process_time | Processing Time | Average time spent processing an event delivery. | ≥ 0 ms | Event subscription | 1 |

**Table 5-9** Dimension description

| Dimension | Key | Value |
|---|---|---|
| Event subscription | subscription_id | Event subscription ID |
| Event subscription - target | target_id | Event target ID |

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# 6 Events

Events are data that complies with specific specifications. Events that event sources publish to EG must comply with the CloudEvents specification.

EG supports the following events:

- Huawei Cloud service: events produced by Huawei Cloud service event sources
- Custom: events produced by custom event sources connected to EG with SDKs

## Example Event

The following is an example of an event published to EG:

```
{
   "events":[{
   "id": "4b26115b-778e-11ec-833e-cf74******",
      "specversion": "1.0",
   "source": "HC.OBS",
   "type": "object:put",
   "datacontenttype": "application/json",
   "subject": "xxx.jpg",
   "time": "2022-01-17T12:07:48.955Z",
   "data": {
      "name": "test01",
      "state": "enable"
   }
   }]
}
```

Table 6-1 describes the parameters in this example.

**Table 6-1** Event parameters

| Parameter | Type | Required | Example Value | Description |
| --- | --- | --- | --- | --- |
| id | String | Yes | 4b26115b-778e-*******-833e-cf74af | Event ID, which identifies an event |
| specversion | String | Yes | 1.0 | Version of the CloudEvents specification |

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| Parameter | Type | Required | Example Value | Description |
| --- | --- | --- | --- | --- |
| source | String | Yes | HC.OBS | Event source that produces the event |
| type | String | Yes | object:put | Event type related to the event source |
| datacontenttype | String | No | application/json | Content format of the **data** parameter<br>Only **application/json** is supported. |
| subject | String | No | xxx.jpg | Event subject |
| time | Timestamp | No | 2022-01-17T12:07:48.955Z | Time when the event was produced |
| data | Struct | No | {<br>"name": "test01",<br>"state": "enable"<br>} | Content of the event in JSON format |

## Sending Events in Batches

The following is an example of the request body for sending events in batches:

```
{
   "events":[{
   "id": "eg-test-001",
   "specversion": "1.0",
   "source": "HC.OBS",
   "type": "object:put",
   "datacontenttype": "application/json",
   "subject": "xxx.jpg",
   "time": "2022-01-17T12:07:48.955Z",
   "data": {
      "name": "test01",
      "state": "enable"
   }
   },
   {
   "id": "eg-test-002",
   "specversion": "1.0",
   "source": "HC.OBS",
   "type": "object:put",
   "datacontenttype": "application/json",
   "subject": "xxx.jpg",
   "time": "2022-01-17T12:07:48.955Z",
   "data": {
      "name": "test01",
      "state": "enable"
   }
   },
   {
   "id": "eg-test-003",
   "specversion": "1.0",
   "source": "HC.OBS",
   "type": "object:put",
   "datacontenttype": "application/json",
   "subject": "xxx.jpg",
```

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```
   "time": "2022-01-17T12:07:48.955Z",
   "data": {
      "name": "test01",
      "state": "enable"
   }
   },...]
}
```

**NOTE**

- Max. size per event: 64 KB
- Max. size of all events per request: 256 KB
- Max. events per request: 20

Response body returned when all events are successfully sent:

```
{"failed_count":0,"events":[{"error_code":null,"error_msg":null,"event_id":"eg-test-003"},
{"error_code":null,"error_msg":null,"event_id":"eg-test-003"},
{"error_code":null,"error_msg":null,"event_id":"eg-test-002"}]}
```

Status code: 200

Response body returned when the number of events per request exceeds the upper limit:

```
{"failed_count":1,"events":[{"error_code":"00533013","error_msg":"Too many events for a
request.","event_id":"eg-test-003"},{"error_code":null,"error_msg":null,"event_id":"eg-test-003"},
{"error_code":null,"error_msg":null,"event_id":"eg-test-002"}]}
```

Status code: 400

Response body returned when the size of an event exceeds the upper limit:

```
{"failed_count":3,"events":[{"error_code":00533012,"error_msg":An event is too large."event_id":"eg-
test-003"},{"error_code":00533012,"error_msg":the number of events exceeds the limit,"event_id":"eg-
test-003"},{"error_code":00533012,"error_msg":the number of events exceeds the limit,"event_id":"eg-
test-002"}]}
```

Status code: 400

Response body returned when the total size of all events per request exceeds the upper limit:

```
{"error_code":"00533007","error_msg":"The total size of a request's all events is too
large.","error_detail":"The total size of a request's all events is too large."}
{"error_code":"00533012","error_msg":"An event is too large.","error_detail":"An event is too large."}
{"error_code":"00533013","error_msg":"Too many events for a request.","error_detail":"Too many events for
a request."}
```

Status code: 400

**NOTE**

If the status code is **400**:

- The total size of all events per request exceeds the upper limit. (Error code: **EG.00533007**; error message: **The total size of a request's all events is too large**)
- The number of events per request exceeds the upper limit. (Error code: **EG.00533013**; error message: **Too many events for a request**)

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# 7 Event Rules

## 7.1 Introduction

Event rules define how to filter and transform events.

- Filter: By configuring **filter rules** in a subscription, specify what events will be routed to the relevant target. For more information about **filter rules**, see **Filter Rule Parameters** and **Example Filter Rules**.
- Transform: By configuring the **transform type** in a subscription, determine how to transform events for the relevant target. For more information about event content transformation, see **Event Content Transformation**.

## 7.2 Filter Rule Parameters

Only events that match your filter rules will be routed to the associated targets. These filter rules must have the same structure as the events.

This section describes the restrictions of filter rules as well as the operators, condition expressions, and matching fields.

### Restrictions

Event filter rules must meet the following requirements:

- Top-level fields can only be **source**, **type**, **subject**, or **data**.
- Top-level fields must include **source**, and **source** only supports the **StringIn** operator.
- The **data** field allows max. 5 subfields, and each can have max. 5 levels.
- Each field can have max. 5 conditions in an OR relationship.
- Multiple fields are ANDed with each other.
- A field that appears more than once at the same level will be used where it appears the last time.

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## Operators

Table 7-1 lists the operators that can be used in event filter rules.

**Table 7-1** Operators

| Operator | Input Value | Condition Value | Description |
| --- | --- | --- | --- |
| StringIn | String/ String[] | String[] values | Check if the input value matches any condition value. |
| StringNotIn | String/ String[] | String[] values | Check if the input value does not match any condition value. |
| StringStartsWith | String/ String[] | String[] values | Check if the input value prefix matches any condition value. |
| StringNotStartsWith | String/ String[] | String[] values | Check if the input value prefix does not match any condition value. |
| StringEndsWith | String/ String[] | String[] values | Check if the input value suffix matches any condition value. |
| StringNotEndsWith | String/ String[] | String[] values | Check if the input value suffix does not match any condition value. |
| NumberIn | Number/ Number[] | Number[] values | Check if the input value matches any condition value. |
| NumberNotIn | Number/ Number[] | Number[] values | Check if the input value does not match any condition value. |
| NumberLessThan | Number/ Number[] | Number value | Check if the input value is less than the condition value. |
| NumberNotLessThan | Number/ Number[] | Number value | Check if the input value is greater than or equal to the condition value. |
| NumberGreaterThan | Number/ Number[] | Number value | Check if the input value is greater than the condition value. |
| NumberNotGreaterThan | Number/ Number[] | Number value | Check if the input value is less than or equal to the condition value. |
| NumberInRange | Number/ Number[] | Number[][] values | Check if the input value is within any condition value range. |
| NumberNotInRange | Number/ Number[] | Number[][] values | Check if the input value is not within any condition value range. |
| IsNull | - | None | Check if the input value is null or undefined. |
| IsNotNull | - | None | Check if the input value is neither null nor undefined. |

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| Operator | Input Value | Condition Value | Description |
| --- | --- | --- | --- |
| IsTrue | Boolean | None | Check if the input value is true. |
| IsNotTrue | Boolean | None | Check if the input value is false. |

## Condition Expressions

Table 7-2 lists the condition expressions that can be used in event filter rules.

**Table 7-2** Condition expressions

| Field Name | Type | Required | Description |
| --- | --- | --- | --- |
| op | String | Yes | Operator |
| value | JSON Type | No | Condition value |
| values | JSON Array | No | Condition value range |

## Matching Fields

Table 7-3 lists the matching fields that can be used in event filter rules.

**Table 7-3** Matching fields

| Field Name | Condition Value Type | Example |
| --- | --- | --- |
| source | JSON array | Event source. The condition value is in the JSON array. This field can only be used with the StringIn operator.<br>Example: **[{"op": "StringIn", "values": ["HC.OBS"]]** |
| type | JSON array | Event type. The condition value is in the JSON array.<br>Example: **[{"op": "StringIn", "values": ["object:put"]]** |
| subject | JSON array | Event body. The condition value is in the JSON array.<br>Example: **[{"op": "StringEndsWith", "values": [".jpg"]]** |
| data | JSON object | Event data. The condition value is in the JSON object, and can be nested in max. 5 layers.<br>Example: **{"state": [{"op": "StringIn", "values": ["running"]]}]** |

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# 7.3 Example Filter Rules

This section provides examples of filter rules of all matching types.

These matching types are available:

- **Exact Match**
- **Exclusion Match**
- **Prefix Match**
- **Prefix Not Matching**
- **Suffix Match**
- **Suffix Not Matching**
- **Value Range Match**
- **Null Match**
- **Non-null Match**
- **True Match**
- **Non-true Match**

## Exact Match

Filter events that exactly match a specified string. As shown in the following table, events whose **source** is **HC.OBS** are matched.

| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}]<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} |

Filter events that exactly match a specified number. As shown in the following table, events whose **age** in **data** is **10** are matched.

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| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"age":10<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"data":{<br>"age":[{<br>"op": "NumberIn",<br>"values":[10]<br>}]<br>}<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"age":10<br>}<br>}]<br>} |

## Exclusion Match

Filter events that do not match a specified string. As shown in the following table, events whose **type** is not **object:get** are matched.

| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"type": [{<br>"op": "StringNotIn",<br>"values": ["object:get"]<br>}]<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} |

Filter events that do not match a specified number. As shown in the following table, events whose **age** in **data** is not **11** are matched.

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| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"age":10<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"data":{<br>"age":[{<br>"op": "NumberNotIn",<br>"values":[11]<br>}]<br>}<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"age":10<br>}<br>}]<br>} |

## Prefix Match

Filter events whose prefix matches a specified value. As shown in the following table, events whose **type** starts with **object:** are matched.

| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"type": [{<br>"op": "StringStartsWith",<br>"values": ["object:"]<br>}]<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} |

## Prefix Not Matching

Filter events whose prefix does not match a specified value. As shown in the following table, events whose **source** does not start with **HC** are matched.

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| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"source": [{<br>"op": "StringNotStartsWith",<br>"values": ["HC"]<br>}]<br>} | None |

## Suffix Match

Filter events whose suffix matches a specified value. As shown in the following table, events whose **subject** ends with **jpg** are matched.

| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"subject": [{<br>"op": "StringEndsWith",<br>"values": ["jpg"]<br>}]<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} |

## Suffix Not Matching

Filter events whose suffix does not match a specified value. As shown in the following table, events whose **subject** does not end with **txt** are matched.

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| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"subject":[{<br>"op": "StringNotEndsWith",<br>"values": ["txt"]<br>}]<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} |

## Value Range Match

Filter events that match a specified value range. As shown in the following table, events whose **size** in **data** is less than **20** are matched.

| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size":10<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"data":{<br>"size":[{<br>"op": "NumberLessThan",<br>"value":20<br>}]<br>}<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size":10<br>}<br>}]<br>} |

As shown in the following table, events whose **size** in **data** is greater than or equal to **2** are matched.

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| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size":10<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"data":{<br>"size":[{<br>"op": "NumberNotLessThan",<br>"value":2<br>}]<br>}<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size":10<br>}<br>}]<br>} |

As shown in the following table, events whose **size** in **data** is greater than **9** are matched.

| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size":10<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"data":{<br>"size":[{<br>"op": "NumberGreaterThan",<br>"value":9<br>}]<br>}<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size":10<br>}<br>}]<br>} |

As shown in the following table, events whose **size** in **data** is less than or equal to **9** are matched.

| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size":10<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"data":{<br>"size":[{<br>"op": "NumberNotGreaterThan",<br>"value":9<br>}]<br>}<br>} | None |

As shown in the following table, events whose **size** in **data** is from 1 to 20 are matched.

| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size":10<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"data":{<br>"size":[{<br>"op": "NumberInRange",<br>"values":[<br>[<br>1,<br>20<br>]<br>]<br>}]<br>}<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size":10<br>}<br>}]<br>} |

As shown in the following table, events whose **size** in **data** is less than **1** or greater than **20** are matched.

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| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size":10<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"data":{<br>"size":[{<br>"op": "NumberNotInRange",<br>"values":[<br>[<br>1,<br>20<br>]<br>]<br>}]<br>}<br>} | None |

## Null Match

Filter events with a null value or undefined field. As shown in the following table, events whose **size** and **age** in **data** are **null** or undefined are matched.

| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size": null<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"data":{<br>"size":[{<br>"op": "IsNull"<br>}],<br>"age":[{<br>"op": "IsNull"<br>}]<br>}<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size":null<br>}<br>}]<br>} |

## Non-null Match

Filter events whose certain field is not **null**. As shown in the following table, events whose **size** and **name** in **data** are not **null** are matched.

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| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size": 10<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"data":{<br>"size":[{<br>"op": "IsNotNull"<br>}],<br>"name":[{<br>"op": "IsNotNull"<br>}]<br>}<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size":10<br>}<br>}]<br>} |

## True Match

Filter events whose certain field is **true**. As shown in the following table, events whose **size** and **name** in **data** are **true** are matched.

| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": true,<br>"state": "enable",<br>"size": true<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"data":{<br>"size":[{<br>"op": "IsTrue"<br>}],<br>"name":[{<br>"op": "IsTrue"<br>}]<br>}<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": true,<br>"state": "enable",<br>"size":true<br>}<br>}]<br>} |

## Non-true Match

Filter events whose certain field is not **true**. As shown in the following table, events whose **name** in **data** is not **true** are matched.

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| Event from Source | Filter Rule | Matched Event |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size": null<br>}<br>}]<br>} | {<br>"source": [{<br>"op": "StringIn",<br>"values": ["HC.OBS"]<br>}],<br>"data":{<br>"name":[{<br>"op": "IsNotTrue"<br>}]<br>}<br>} | {<br>"events":[{<br>"id": "4b26115b-778e-11ec-******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:00.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable",<br>"size": null<br>}<br>}]<br>} |

# 7.4 Event Content Transformation

EG transforms CloudEvents-compliant events so that they can be processed by specified targets.

Supported transform types: pass-through, variables, constants.

## Pass-through

Directly route CloudEvents-compliant events to the target. Example:

| Before Transformation | Transform Type | After Transformation |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-73e-cf74a******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:48.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} | Pass-through | {<br>"events":[{<br>"id": "4b26115b-73e-cf74******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:48.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} |

## Variables

Route variables in CloudEvents-compliant events to the target by using a template. Example:

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| Before Transformation | Transform Type | After Transformation |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-73e-cf74a******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:48.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} | Parameter<br>{"name":"$.data.name"}<br>Template<br>My name is ${name}<br>**NOTE**<br>If the event target is **FunctionGraph (function computing)**, the template must be in JSON format. Example:<br>{"name":"${name}"} | My name is test01<br>**NOTE**<br>If the event target is **FunctionGraph (function computing)**, the transformation result is as follows:<br>{"name": "test01"} |

Example of complex transformation from OBS to EG and then to FunctionGraph:

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| Before Transformation | Transform Type | After Transformation |
| --- | --- | --- |
| <pre>{<br>"specversion": "1.0",<br>"id": "******9db447aa3******",<br>"source": "HC.OBS.DWR",<br>"type": "OBS:DWR:ObjectCreated:PUT",<br>"datacontenttype": "application/json",<br>"dataschema": "",<br>"subject": "test.txt",<br>"time": "2023-08-01T11:41:51.712759419Z",<br>"ttl": "4000",<br>"data": {<br>"eventVersion": "3.0",<br>"eventSource": "OBS",<br>"eventRegion": "cn-north-4",<br>"eventTime": "2023-08-01T19:41:47.879Z",<br>"eventName": "ObjectCreated:Put",<br>"userIdentity": {<br>"ID": "******fef0f08c******"<br>},<br>"requestParameters": {<br>"sourceIPAddress": "1**.1**.1**.1**"<br>},<br>"responseElements": {<br>"x-obs-request-id": "******47aa3cdafb******",<br>"x-obs-id-2": "",<br>"x-amz-request-id": "",<br>"x-amz-id-2": ""<br>},<br>"obs": {<br>"Version": "1.0",<br>"configurationId": "******4aaac1******",<br>"bucket": {<br>"name": "test",<br>"ownerIdentity": {<br>"ID": "******f1234567******"<br>},<br>"bucket": "test",<br>"arn": ""<br>},<br>"object": {<br>"key": "test.txt",<br>"eTag": "******48ce552c3******",<br>"size": 13,<br>"versionId": "******BE7FFFF******",<br>"sequencer": "1",<br>"oldpsxpth": ""<br>}<br>}<br>}<br>}</pre> | Parameters<br><pre>{<br>"eventVersion": "$.data.eventVersion",<br>"eventTime": "$.data.eventTime",<br>"requestParameters": "$.data.requestParameters.sourceIPAddress",<br>"configurationId": "$.data.obs.configurationId",<br>"eTag": "$.data.obs.object.eTag",<br>"sequencer": "$.data.obs.object.sequencer",<br>"key": "$.data.obs.object.key",<br>"size": "$.data.obs.object.size",<br>"arn": "$.data.obs.bucket.arn",<br>"name": "$.data.obs.bucket.name",<br>"ownerIdentity": "$.data.obs.bucket.ownerIdentity.ID",<br>"Region": "$.data.eventRegion",<br>"eventName": "$.type",<br>"userIdentity": "$.data.userIdentity.ID"<br>}</pre> Template<br><pre>{<br>"Records": [<br>{<br>"eventVersion": "${eventVersion}",<br>"eventTime": "${eventTime}",<br>"requestParameters": {<br>"sourceIPAddress": "${requestParameters}"<br>},<br>"obs": {<br>"configurationId": "${configurationId}",<br>"object": {<br>"eTag": "${eTag}",<br>"sequencer": "${sequencer}",<br>"key": "${key}",<br>"size": "${size}"<br>},<br>"bucket": {<br>"arn": "${arn}",<br>"name": "${name}",<br>"ownerIdentity": {<br>"PrincipalId": "${ownerIdentity}"<br>}<br>}<br>},<br>"Region": "${Region}",<br>"eventName": "${eventName}",</pre> | <pre>{<br>"Records": [<br>{<br>"eventVersion": "3.0",<br>"eventTime": "2023-08-01T19:41:47.879Z",<br>"requestParameters": {<br>"sourceIPAddress": "1**.1**.1**.1**"<br>},<br>"obs": {<br>"configurationId": "******4aaac1******",<br>"object": {<br>"eTag": "******48ce552c3******",<br>"sequencer": "1",<br>"key": "test.txt",<br>"size": "13"<br>},<br>"bucket": {<br>"arn": "",<br>"name": "test",<br>"ownerIdentity": {<br>"PrincipalId": "******f1234567******"<br>}<br>}<br>},<br>"Region": "cn-north-4",<br>"eventName": "OBS:DWR:ObjectCreated:PUT",<br>"userIdentity": {<br>"principalId": "******fef0f08c******"<br>}<br>}<br>]<br>}</pre> **NOTE** |

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| Before Transformation | Transform Type | After Transformation |
| --- | --- | --- |
| | "userIdentity": {<br>"principalId": "${userIdentity}"<br>}<br>}<br>]<br>}<br>**NOTE**<br>The value in the template is the key of the corresponding parameter. | |

## Constants

Route constants in events to the target. Example:

| Before Transformation | Rule | After Transformation |
| --- | --- | --- |
| {<br>"events":[{<br>"id": "4b26115b-73cf74a******",<br>"specversion": "1.0",<br>"source": "HC.OBS",<br>"type": "object:put",<br>"datacontenttype": "application/json",<br>"subject": "xxx.jpg",<br>"time": "2022-01-17T12:07:48.955Z",<br>"data": {<br>"name": "test01",<br>"state": "enable"<br>}<br>}]<br>} | Parameter<br>test01<br>**NOTE**<br>If the event target is **FunctionGraph (function computing)**, the rule must be in JSON format. Example:<br>{"name": "test01"} | test01<br>**NOTE**<br>If the event target is **FunctionGraph (function computing)**, the transformation result is as follows:<br>{"name": "test01"} |

## More Examples

1. After you set a DMS for RabbitMQ or DMS for RocketMQ **event source** for a subscription, messages will contain the **context** field in **data** after being transformed to CloudEvents-compliant events. If you set the transform type to **Variables** for the **event target**, the rule must also contain the **context** field. Example:

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| Before Transformation | Transform Type | After Transformation |
| --- | --- | --- |
| {<br>"type":<br>"ROCKETMQ:CloudTrace:RocketmqCall",<br>"data": {<br>"context": {<br>"name": "test01",<br>"state": "enable"<br>}<br>},<br>"source": "zhang_roc",<br>"time":<br>"2023-02-01T10:47:07Z",<br>"datacontenttype":<br>"application/json",<br>"specversion": "1.0",<br>"id":<br>"2f885496-570c-4925-82fd-d1ad09******",<br>"subject": "ROCKETMQ:cn-north-7:eec88b34-9470-483e-8961-edb168******/0de095e33e00d36e2fd2c0019a******:ROCKETMQ:zhang_roc"<br>} | Parameter<br>{"name":"$.data.context.name"}<br>Template<br>My name is ${name} | My name is test01 |

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# 8 Event Targets

Event targets are destinations that receive and process events.

EG supports the following event targets:

- Huawei Cloud services connected to EG.
- Custom event processing services

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# 9 Network Management

## 9.1 Connections

You can use the default connection for a public webhook, or a custom one (with specified VPC and subnet) for a private webhook.

Custom connections can also be based on DMS for Kafka.

NOTE

- A client or proxy client provides a webhook URL to receive data from a specified server. The client updates accordingly once the server pushes data to the URL.
- Webhook URLs must support TLS 1.2 and secure encryption algorithms.

### Creating a Webhook Connection

Before creating a connection, ensure that you have VPC permissions.

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

**Step 2** In the navigation pane, choose **Network Management** > **Connections**.

**Step 3** Click **Create Connection**.

NOTE

When you create your first connection, your authorization will be required and an agency will be automatically created. For details, see **Authorization**.

**Step 4** Configure the connection by referring to **Table 9-1**.

**Table 9-1** Connection parameters

| Parameter | Description |
| --- | --- |
| Type | Select **WEBHOOK**. |
| Name | Connection name.<br>The name cannot be modified once the connection is created. |

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| Parameter | Description |
| --- | --- |
| Description | Describe the connection. |
| VPC | Select a VPC.<br>The VPC cannot be changed once the connection is created. |
| Subnet | Select a subnet.<br>The subnet cannot be changed once the connection is created. |

**Step 5** Click **OK**.

**----End**

## Creating a DMS for Kafka Connection

Before creating such a connection, ensure that you already have a DMS for Kafka instance.

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

**Step 2** In the navigation pane, choose **Network Management** > **Connections**.

**Step 3** Click **Create Connection**.

NOTE

When you create your first connection, your authorization will be required and an agency will be automatically created. For details, see **Authorization**.

Kafka instance parameters cannot be modified once the connection is created.

**Step 4** Configure the connection by referring to **Table 9-2**.

**Table 9-2** Kafka connection parameters

| Parameter | Description |
| --- | --- |
| Type | Select **DMS for Kafka**. |
| Name | Connection name.<br>The name cannot be modified once the connection is created. |
| Description | Describe the connection. |
| Instance | Select a Kafka instance. |
| Access Mode | Select **Ciphertext Access** or **Plaintext Access**. |
| Security Protocol | If you select **Ciphertext Access** for **Access Mode**, the corresponding security protocol will be displayed. |

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| Parameter | Description |
| --- | --- |
| SASL_SSL Authentication | Available when SASL_SSL authentication is enabled for the Kafka instance. Select an authentication mechanism.<br>• **PLAIN**: a simple username and password verification mechanism.<br>• **SCRAM-SHA-512**: uses the hash algorithm to generate credentials for usernames and passwords to verify identities. SCRAM-SHA-512 is more secure than PLAIN. |
| Username | Available when SASL_SSL authentication is enabled for the Kafka instance. Enter a username. |
| Password | Available when SASL_SSL authentication is enabled for the Kafka instance. Enter a password. |
| Acknowledgments | Number of acknowledgments the producer requires the server to return before considering a request complete.<br>• **None**: The producer will not wait for any acknowledgment from the server at all. The record will be immediately added to the socket buffer and considered sent. No guarantee can be made that the server has received the record.<br>• **Leader only**: The leader will write the record to its local log but will respond without waiting until receiving full acknowledgement from all followers. If the leader fails immediately after acknowledging the record but before the followers have replicated it, the record will be lost.<br>• **All**: The leader will wait for the full set of in-sync replicas to acknowledge the record. This is the strongest available guarantee because the record will not be lost as long as there is just one working replica. |

**Step 5** Click **OK**.

**----End**

## Editing a Connection

Only the description of a connection can be modified.

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

**Step 2** In the navigation pane, choose **Network Management** > **Connections**.

**Step 3** Click **Edit** in the row that contains the desired connection.

**Step 4** Modify the description and click **OK**.

**----End**

## Deleting a Connection

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

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**Step 2** In the navigation pane, choose **Network Management** > **Connections**.

**Step 3** Click **Delete** in the row that contains the desired connection.

NOTE

If the connection to delete is associated with subscriptions, disassociate it first.

**Step 4** Click **Yes**.

**----End**

# 9.2 Endpoints

An endpoint is an EG access address for you to push events from a custom source.

EG supports the following endpoints:

- Public endpoints: fixed public domain names for specific regions

  **Table 9-3** Public endpoints

| Region | Primary Domain Name | Secondary Domain Name |
| --- | --- | --- |
| EU-Dublin | events.eu-west-101.myhuaweicloud.eu | - |

- Private endpoints: EG private domain names you create for pushing custom events

## Creating a Private Endpoint

Before creating a private endpoint, ensure that you have DNS and VPCEP permissions.

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

**Step 2** In the navigation pane, choose **Network Management** > **Endpoints**.

**Step 3** Click **Create Endpoint**.

**Step 4** Configure the endpoint by referring to **Table 9-4**.

**Table 9-4** Endpoint parameters

| Parameter | Description |
| --- | --- |
| Name | Endpoint name.<br>The name cannot be modified once the endpoint is created. |
| VPC | Select a VPC.<br>The VPC cannot be changed once the endpoint is created. |

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| Parameter | Description |
| --- | --- |
| Subnet | Select a subnet.<br>The subnet cannot be changed once the endpoint is created. |
| Description | Describe the endpoint. |

**Step 5** Click **OK**.

**NOTICE**

- Creating an endpoint will generate a VPC endpoint with fees. Delete the created endpoint when you no longer need it.
- The VPC and subnet cannot be changed once the endpoint is created.

**----End**

## Editing a Private Endpoint

Modify the description of an endpoint.

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

**Step 2** In the navigation pane, choose **Network Management** > **Endpoints**.

**Step 3** Click **Edit** in the row that contains the desired endpoint.

**Step 4** Modify the description and click **OK**.

**----End**

## Deleting a Private Endpoint

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

**Step 2** In the navigation pane, choose **Network Management** > **Endpoints**.

**Step 3** Click **Delete** in the row that contains the desired endpoint.

**Step 4** Click **Yes**.

NOTE

If the related DNS and VPCEP resources have been deleted, the private endpoint may fail to be deleted. In this case, contact EG O&M personnel.

**----End**

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# 10 IAM Projects and Enterprise Projects

## Creating an IAM Project and Assigning Permissions

- Creating an IAM Project

  Go to the management console, hover over the username in the upper right corner, and choose **Identity and Access Management** from the drop-down list. Choose **Projects** in the navigation pane, and click **Create Project**. On the displayed **Create Project** page, select a region and enter a project name.

- Authorization

  You can assign permissions (for resources and operations) to user groups to associate projects with the user groups. To do so, add users to a user group to control projects that the users can access and the resources on which the users can perform operations. For details, see .

## Creating an Enterprise Project and Assigning Permissions

- Creating an Enterprise Project

  Go to the management console, and choose **Enterprise** > **Project Management** in the upper right corner. On the **Enterprise Project Management** console, click **Create Enterprise Project** to create a project.

  NOTE

  **Enterprise** is available on the management console only if you have enabled the enterprise project, or your account is the primary account. To enable this function, contact customer service.

- Authorization

  You can add a user group to an enterprise project and configure a policy to associate the enterprise project with the user group. To do so, add users to a user group to control projects that the users can access and the resources on which the users can perform operations. Perform the following procedure:

  a. On the **Enterprise Management** console, click the name of an enterprise project to go to the details page.

  b. On the **Permissions** tab, click **Authorize User Group** to go to the **User Groups** page on the IAM console. Associate the enterprise project with a user group and assign permissions to the group.

     For details, see .

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- Associating Resources with Enterprise Qualifications

  Enterprise projects help you centrally manage cloud resources.

  – Selecting an enterprise project when buying EG

    On the page for buying EG, select an enterprise project to associate your resources with it.

  – Adding resources

    On the **Enterprise Project Management** page, you can add existing EG resources to a target enterprise project.

    **default** is the default enterprise project. Resources that are not allocated to any enterprise project under your account are listed in this project.

  For more information, see .

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# 11 Authorization

Some functions of EG require your authorization and an agency will be automatically created. For details, see **Table 11-1**.

**Table 11-1** Agency information

| Agency Name | Authorizer | Authorized | Service to Access and Required Permission | Function |
| --- | --- | --- | --- | --- |
| EG_DELEGATE_FG_AGENCY | User | FunctionGraph | VPC: VPC Administrator<br>DNS: DNS ReadOnlyAccess | • Create RabbitMQ and RocketMQ custom event sources<br>• Create subscriptions with a private HTTPS endpoint. |
| EG_AGENCY | User | EventGrid | EG: EG Publisher | Create RabbitMQ and RocketMQ custom event sources |

## Authorization Scenarios

1. When **you create your first connection**, your authorization will be required. If you agree to authorize, an agency named **EG_DELEGATE_FG_AGENCY** will be automatically created in IAM. View this agency on the IAM console.

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**Table 11-2** Permissions of EG_DELEGATE_FG_AGENCY

| Permission | Description |
| --- | --- |
| VPC Administrator | Required for FunctionGraph to connect to VPC when you create a connection. |
| DNS ReadOnlyAccess | Required for FunctionGraph to connect to VPC when you create a connection. |

2. When **you create your first DMS for RabbitMQ or DMS for RocketMQ event source**, your authorization will be required. If you agree to authorize, agencies named **EG_DELEGATE_FG_AGENCY** and **EG_AGENCY** will be automatically created in IAM. View these agencies on the IAM console.

**Table 11-3** Permissions of EG_DELEGATE_FG_AGENCY and EG_AGENCY

| Permission | Description |
| --- | --- |
| VPC Administrator | Required for FunctionGraph to connect to VPC when you create a DMS event source. |
| DNS ReadOnlyAccess | Required for FunctionGraph to connect to VPC when you create a DMS event source. |
| EG Publisher | Required for EG to publish messages to a channel when you create a DMS event source. |

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# 12 Event Monitoring

## 12.1 Supported Metrics

### Introduction

This section describes the monitoring metrics and dimensions of EG. View these metrics on the EG console.

### Metrics

**Table 12-1** Event delivery metrics

| ID | Name | Description | Value Range | Monitored Object | Raw Data Monitoring Period (Minute) |
|---|---|---|---|---|---|
| num | Total Deliveries | Number of times event delivery attempts are made.<br>Unit: count | ≥ 0 | Event subscription | 1 |
| success_num | Successful Deliveries | Number of times events are finally delivered.<br>Unit: count | ≥ 0 | Event subscription | 1 |
| process_time | Processing Time | Average time spent processing all event deliveries in a period.<br>Unit: ms | ≥ 0 ms | Event subscription | 1 |

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| ID | Name | Description | Value Range | Monitored Object | Raw Data Monitoring Period (Minute) |
|---|---|---|---|---|---|
| fail_num | Failed Events | Number of events that fail to be delivered without needing a retry attempt.<br>Unit: count | ≥ 0 | Event subscription | 1 |

**Table 12-2** Event access metrics

| ID | Name | Description | Value Range | Monitored Object | Raw Data Monitoring Period (Minute) |
|---|---|---|---|---|---|
| num | Total Accesses | Number of times event access attempts are made.<br>Unit: count | ≥ 0 | Event channel | 1 |
| success_num | Successful Accesses | Number of times events are finally accessed.<br>Unit: count | ≥ 0 | Event channel | 1 |
| fail_num | Failed Accesses | Number of times events could not be accessed.<br>Unit: count | ≥ 0 | Event channel | 1 |
| process_time | Processing Time | Average time spent processing all event accesses in a period.<br>Unit: ms | ≥ 0 ms | Event channel | 1 |

## Dimensions

| Key | Value |
|---|---|
| subscription_id | Event subscription ID |
| channel_id | Event channel ID |

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# 12.2 Viewing Monitoring Data

EG monitors event subscriptions and channels, and allows you to query event access and delivery information without any configuration.

## Procedure

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

**Step 2** Click in the upper left and select a region.

**Step 3** Click in the upper left and choose **Middleware** > **EventGrid**.

**Step 4** On the **Event Subscriptions** page, click in the row that contains the desired subscription, and view the event delivery monitoring data.

- View the monitoring data of a single event target.
- View the monitoring data of the last hour, last 4 hours, last 24 hours, last 7 days, or a custom time range.
- Specify a period (1 minute, 5 minutes, or 20 minutes) and method (average, maximum, or minimum).

**Step 5** On the **Event Channels** page, click in the row that contains the desired channel, and view the event access monitoring data.

- View the monitoring data of a single event source.
- View the monitoring data of the last hour, last 4 hours, last 24 hours, last 7 days, or a custom time range.
- Specify a period (1 minute, 5 minutes, or 20 minutes) and method (average, maximum, or minimum).

**----End**

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# 13 Auditing

## 13.1 EG Operations Recorded by CTS

Operations related to EG can be recorded with Cloud Trace Service (CTS) for query, audit, and backtracking.

**Table 13-1** EG operations that can be recorded by CTS

| Operation | Resource Type | Trace |
| --- | --- | --- |
| Create event channel | channel | CreateChannel |
| Update event channel | channel | UpdateChannel |
| Delete event channel | channel | DeleteChannel |
| Create event source | source | CreateEventSource |
| Update event source | source | UpdateEventSource |
| Delete event source | source | DeleteEventSource |
| Create event subscription | subscription | CreateSubscription |
| Update event subscription | subscription | UpdateSubscription |
| Delete event subscription | subscription | DeleteSubscription |
| Enable or disable event subscription | subscription | OperateSubscription |
| Create connection | connection | CreateConnection |
| Edit connection | connection | UpdateConnection |
| Delete connection | connection | DeleteConnection |
| Create endpoint | endpoint | CreateEndpoint |

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| Operation | Resource Type | Trace |
| --- | --- | --- |
| Edit endpoint | endpoint | CreateEndpoint |
| Delete endpoint | endpoint | CreateEndpoint |

# 13.2 Querying Real-Time Traces

## Scenarios

After you enable CTS and the management tracker is created, CTS starts recording operations on cloud resources. After a data tracker is created, the system starts recording operations on data in OBS buckets. CTS stores operation records generated in the last 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**
- **Viewing Real-Time Traces in the Trace List of the Old Edition**

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

1. Log in to the management console.
2. Click in the upper left corner and choose Management & Deployment > **Cloud Trace Service**. The CTS console is displayed.
3. Choose **Trace List** in the navigation pane on the left.
4. On the **Trace List** page, use advanced search to query traces. You can combine one or more filters.
   - **Trace Name**: Enter a trace name.
   - **Trace ID**: Enter a trace ID.
   - **Resource Name**: Enter a resource name. 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.
   - **Resource ID**: Enter a resource ID. Leave this field empty if the resource has no resource ID or if resource creation failed.
   - **Trace Source**: Select a cloud service name from the drop-down list.
   - **Resource Type**: Select a resource type from the drop-down list.
   - **Operator**: Select one or more operators from the drop-down list.
   - **Trace Status**: Select **normal**, **warning**, or **incident**.
     - **normal**: The operation succeeded.
     - **warning**: The operation failed.
     - **incident**: The operation caused a fault that is more serious than the operation failure, for example, causing other faults.

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- Time range: Select **Last 1 hour**, **Last 1 day**, or **Last 1 week**, or specify a custom time range.

5. On the **Trace List** page, you can also export and refresh the trace list, and customize the list display settings.
   - 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 5000 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.
6. For details about key fields in the trace structure, see section "Trace References" > "Trace Structure" and section "Trace References" > "Example Traces".
7. (Optional) On the **Trace List** page of the new edition, click **Go to Old Edition** in the upper right corner to switch to the **Trace List** page of the old edition.

## Viewing Real-Time Traces in the Trace List of the Old Edition

1. Log in to the management console.
2. Click in the upper left corner and choose **Management & Deployment** > **Cloud Trace Service**. The CTS console is displayed.
3. Choose **Trace List** in the navigation pane on the left.
4. Each time you log in to the CTS console, the new edition is displayed by default. Click **Go to Old Edition** in the upper right corner to switch to the trace list of the old edition.
5. Set filters to search for your desired traces. The following filters are available:
   - **Trace Type**, **Trace Source**, **Resource Type**, and **Search By**: Select a filter from the drop-down list.
     - If you select **Resource ID** for **Search By**, specify a resource ID.
     - If you select **Trace name** for **Search By**, specify a trace name.
     - If you select **Resource name** for **Search By**, specify a resource name.
   - **Operator**: Select a user.
   - **Trace Status**: Select **All trace statuses**, **Normal**, **Warning**, or **Incident**.
   - Time range: You can query traces generated during any time range in the last seven days.
   - Click **Export** to export all traces in the query result as a CSV file. The file can contain up to 5000 records.
6. Click **Query**.
7. On the **Trace List** page, you can also export and refresh the trace list.

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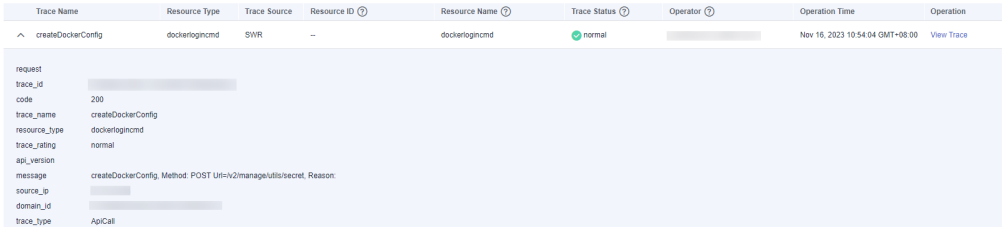
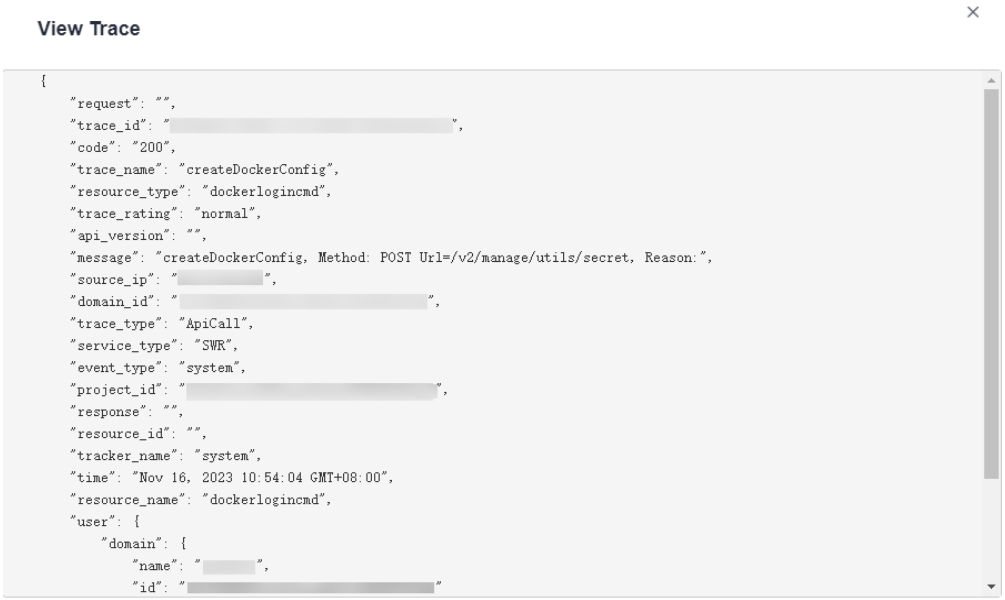
- Click **Export** to export all traces in the query result as a CSV file. The file can contain up to 5000 records.
- Click to view the latest information about traces.

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




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




10. For details about key fields in the trace structure, see section "Trace References" > "Trace Structure" and section "Trace References" > "Example Traces" in the *CTS User Guide*.
11. (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.

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