Graph Engine Service

API Reference

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HUAWEI CLOUD COMPUTING TECHNOLOGIES CO., LTD.

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1 Before You Start

1.1 Overview

Welcome to *Graph Engine Service API Reference*. Graph Engine Service (GES) is the first commercial self-built distributed native graph engine with independent intellectual property rights in the industry. It facilitates querying and analysis of graph structure data based on relationships. It is specifically suited for scenarios involving social applications, enterprise relationship analysis, risk control, recommendations, public opinions, and anti-fraud.

This document describes how to use application programming interfaces (APIs) to perform operations on GES resources.

- Management Plane APIs

  Management plane APIs provide graph management functions, including creating, stopping, starting, restoring, and upgrading graphs, importing, exporting, and clearing data, creating, querying, and deleting graph backups, and managing metadata. You need to call the management plane APIs to perform these operations.

- Service Plane APIs

  Service plane APIs provide graph service functions, including adding, deleting, querying, and modifying vertices, edges, and metadata files, performing Gremlin queries, and running algorithms. You need to call the service plane APIs to perform these operations.

Before calling APIs of GES, ensure that you are familiar with GES concepts.

1.2 Constraints and Limitations on Using GES

1.2.1 Using Service Plane APIs

You can access the service plane APIs by anyone of the following methods:

- Through the ECS. The VPC for creating the ECS must be the same as that selected during graph creation. If the same security group is selected, you can

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directly access the APIs. If the security groups are not the same, enable the access permission for the ECS in the security group where the graph is created. That is, enable ports **80** and **443** for inbound traffic and all ports for outbound traffic. The ingress and egress ports support HTTP and HTTPS access respectively. In this scenario, **SERVER_URL** of the APIs is the private access address in the graph details on the GES console or the value of the **privateIp** field in the response body of the management plane API for querying graph details.

- Through the ECS. The VPC for creating the ECS is not the same as that selected during graph creation. You need to create a VPC peering connection between the VPC to which the ECS belongs and the VPC in which the graph is created. In addition, you need to enable the access permission for the ECS in the security group where the graph is created. That is, enable ports **80** and **443** for inbound traffic and all ports for outbound traffic. In this scenario, **SERVER_URL** of the APIs is the private access address in the graph details on the GES console or the value of the **privateIp** field in the response body of the management plane API for querying graph details.
- Through the public network. You need to create an EIP and enable the access permission for the client in the security group where the graph is created, that is, enable ports **80** and **443** for inbound traffic and all ports for outbound traffic. In this scenario, **SERVER_URL** of the APIs is the public access address in the graph details on the GES console or the value of the **publicIp** field in the response body of the management plane API for querying graph details (also the EIP you bind or create).

1.2.2 Naming OBS Objects

The OBS object names supported by GES can contain the following characters:

Letters and digits	0-9, a-z, A-Z
Special characters	! - _ . * ' ( )

The following characters are not supported:

Special characters	**\{^}%`]">[~<#|&@:,$=+? and spaces**
ASCII control characters	Range: • 00–1F in hexadecimal form (0–31 in decimal form) • 7F (127 in decimal form)

1.3 Concepts

- User

  A user is created in IAM to use cloud services. Each user has its own identity credentials (password and access keys).

  API authentication requires information such as the account name, username, and password.

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- Region

  Regions are geographic areas isolated from each other. Resources are region-specific and cannot be used across regions through internal network connections. For low network latency and quick resource access, select the nearest region.

- AZ

  An AZ comprises of one or more physical data centers equipped with independent ventilation, fire, water, and electricity facilities. Computing, network, storage, and other resources in an AZ are logically divided into multiple clusters. AZs within a region are interconnected using high-speed optical fibers to allow you to build cross-AZ high-availability systems.

- Project

  Projects group and isolate resources (including compute, storage, and network resources) across physical regions. A default project is provided for each region, and subprojects can be created under each default project. Users can be granted permissions to access all resources in a specific project. For more refined access control, create subprojects under a project and apply for resources in the subprojects. Users can then be assigned permissions to access only specific resources in the subprojects.

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2 Calling APIs

2.1 Making an API Request

2.1.1 Making a Management Plane API Request

This section describes the structure of a REST API request on the management plane of GES.

Request URI

A request URI is in the following format:

{URI-scheme} :// {Endpoint} / {resource-path} ? {query-string}

Although a request URI is included in the request header, most programming languages or frameworks require the request URI to be transmitted separately.

- **URI-scheme**: Protocol used to transmit requests. All APIs use **HTTPS**.
- **Endpoint**: Endpoints vary depending on services and regions.
- **resource-path**: Access path of an API for performing a specified operation. Obtain the path from the URI of an API. For example, the **resource-path** of the API used to obtain a user token is **/v3/auth/tokens**.
- **query-string**: Query parameter, which is optional. Ensure that a question mark (?) is included before each query parameter that is in the format of "Parameter name=Parameter value". For example, **? limit=10** indicates that a maximum of 10 data records will be displayed.

Request Methods

The HTTP protocol defines the following request methods that can be used to send a request to the server:

- **GET**: requests the server to return specified resources.
- **PUT**: requests the server to update specified resources.
- **POST**: requests the server to add resources or perform special operations.

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- **DELETE**: requests the server to delete specified resources, for example, an object.
- **HEAD**: same as GET except that the server must return only the response header.
- **PATCH**: requests the server to update partial content of a specified resource. If the resource does not exist, a new resource will be created.

Request Header

You can also add additional header fields to a request, such as the fields required by a specified URI or HTTP method. For example, to request for the authentication information, add **Content-Type**, which specifies the request body type.

Common request header fields are as follows:

Table 2-1 Common request headers

Parameter	Mandatory	Description	Example
Content-Type	Yes	Specifies the request body type or format. This field is mandatory and its default value is **application/json**. Other values of this field will be provided for specific APIs if any.	application/json
X-Auth-Token	This field is mandatory only for authentication using tokens.	Specifies a user token only for token-based API authentication.	-
X-Project-ID	No	Specifies a subproject ID. This parameter is mandatory only in multi-project scenarios.	e9993fc787d94b6c886cbaa340f9c0f4
Authorization	This field is mandatory for authentication using AK/SK.	Specifies the signature authentication information. The value is obtained from the request signing result.	-

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Parameter	Mandatory	Description	Example
X-Sdk-Date	This field is mandatory for authentication using AK/SK.	Specifies the time when a request is sent. The time is in *YYYYMMDD***T***HHMMSS***Z** format. The value is the current Greenwich Mean Time (GMT) time of the system.	20150907T101459Z
Host	This field is mandatory for authentication using AK/SK.	Specifies the information about the requested server. The value can be obtained from the URL of the service API. The value is in the *hostname[:port]* format. Default port used for **https** requests is port **443**.	code.test.com or code.test.com:443
Content-Length	This field is mandatory for POST and PUT requests, but must be left blank for GET requests.	Specifies the length of the request body. The unit is byte.	3495
X-Language	No	Request language	en-us

NOTE

In addition to token-based authentication, authentication using access key ID/secret access key (AK/SK) is also supported. During AK/SK-based authentication, an SDK is used to sign the request, and the **Authorization** (signature information) and **X-Sdk-Date** (time when the request is sent) header fields are automatically added to the request.

Request Body

The body of a request is often sent in a structured format as specified in the **Content-Type** header field. The request body transfers content except the request header.

The request body varies between APIs. Some APIs do not require the request body, such as the APIs requested using the GET and DELETE methods.

For the API of obtaining a user token, obtain the request parameters and parameter description in the API request. The following provides an example

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request with a body included. Replace *username*, *domianname*, ******** (login password), and *xxxxxxxxxxxxxxxxx* (project name) with the actual values.

At this point, all the necessary data for making the request is in place. You can send the API call by directly writing code. For the IAM API that is used to obtain a user token, the response header will include a field called **x-subject-token**, which contains the required user token. Once you have obtained the token, you can use it for authentication when calling other APIs.

2.1.2 Making a Service Plane API Request

This section describes the structure of a REST API on the service plane of GES.

Request URI

A request URI of a service plane API of GES is in the following format:

{URI-scheme} :// {SERVER_URL} / {resource-path} ? {query-string}

Although a request URI is included in the request header, most programming languages or frameworks require the request URI to be transmitted separately.

- **URI-scheme**: Protocol used to transmit requests. All APIs use **HTTPS**.
- **SERVER_URL**: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.
- **resource-path**: Access path of an API for performing a specified operation. Obtain the value from the URI module of the API, for example, **ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=query**.
- **query-string**: Query parameter, which is optional. Ensure that a question mark (?) is included before each query parameter that is in the format of "Parameter name=Parameter value". For example, **? limit=10** indicates that a maximum of 10 data records will be displayed.

Request Methods

The HTTP protocol defines the following request methods that can be used to send a request to the server:

- **GET**: requests the server to return specified resources.
- **PUT**: requests the server to update specified resources.
- **POST**: requests the server to add resources or perform special operations.
- **DELETE**: requests the server to delete specified resources, for example, an object.
- **HEAD**: same as GET except that the server must return only the response header.
- **PATCH**: requests the server to update partial content of a specified resource. If the resource does not exist, a new resource will be created.

Request Header

You can also add additional header fields to a request, such as the fields required by a specified URI or HTTP method. For example, to request for the authentication information, add **Content-Type**, which specifies the request body type.

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Common request header fields are as follows:

Table 2-2 Common request headers

Parameter	Mandatory	Description	Example
Content-Type	Yes	Specifies the request body type or format. This field is mandatory and its default value is **application/json**. Other values of this field will be provided for specific APIs if any.	application/json
X-Auth-Token	Yes	Specifies a user token only for token-based API authentication.	-
X-Language	Yes	Request language	en-us

Request Message Body

The body of a request is often sent in a structured format as specified in the **Content-Type** header field. The request body transfers content except the request header.

Request bodies vary with APIs. Some APIs do not require a request body, such as the APIs using **GET** and **DELETE** methods.

For the IAM API that is used to obtain a user token, obtain the request parameters and parameter description in the API request. The following provides an example request with a body included. Replace *username*, *domainname*, ********* (login password), and *xxxxxxxxxxxxxxxxx* (project name) with the actual values.

At this point, all the necessary data for making the request is in place. You can send the API call by directly writing code. For the IAM API that is used to obtain a user token, the response header will include a field called **x-subject-token**, which contains the required user token. Once you have obtained the token, you can use it for authentication when calling other APIs.

2.2 Authentication

2.2.1 Authentication of Management Plane APIs

Requests for calling a management plane API of GES can be authenticated using either of the following methods:

- Token-based authentication: Requests are authenticated using a token.

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- AK/SK-based authentication: Requests are authenticated by encrypting the request body using an AK/SK pair. AK/SK-based authentication is recommended because it is more secure.

Token-based Authentication

A token specifies temporary permissions in a computer system. During API authentication using a token, the token is added to requests to get permissions for calling the API.

When calling the API to obtain a user token, you must set **auth.scope** in the request body to **project**.

```
{
   "auth": {
      "identity": {
         "methods": [
            "password"
         ],
         "password": {
            "user": {
               "name": "username",
               "password": "********",
               "domain": {
                  "name": "domainname"
               }
            }
         }
      },
      "scope": {
         "project": {
            "name": "xxxxxxxx"
         }
      }
   }
}
```

NOTE

- The validity period of a token is 24 hours. When using a token for authentication, cache it to prevent frequently calling the IAM API used to obtain a user token.
- To obtain the token, the GES **scope** must be **project** (cannot be **domain**).

After a token is obtained, the **X-Auth-Token** header field must be added to requests to specify the token when calling other APIs. For example, if the token is **ABCDEFJ....**, **X-Auth-Token: ABCDEFJ....** can be added to a request:

2.2.2 Authentication of Service Plane APIs

Calling a service plane API of GES can only be authenticated using tokens.

Token-based Authentication

A token specifies temporary permissions in a computer system. During API authentication using a token, the token is added to requests to get permissions for calling the API.

When calling the API to obtain a user token, you must set **auth.scope** in the request body to **project**.

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```
{
    "auth": {
        "identity": {
            "methods": [
                "password"
            ],
            "password": {
                "user": {
                    "name": "username",
                    "password": "********",
                    "domain": {
                        "name": "domainname"
                    }
                }
            }
        },
        "scope": {
            "project": {
                "name": "xxxxxxxx"
            }
        }
    }
}
```

NOTE

- The validity period of a token is 24 hours. When using a token for authentication, cache it to prevent frequently calling the IAM API used to obtain a user token.
- To obtain the token, the GES **scope** must be **project** (cannot be **domain**).

After a token is obtained, the **X-Auth-Token** header field must be added to requests to specify the token when calling other APIs. For example, if the token is **ABCDEFJ....**, **X-Auth-Token: ABCDEFJ....** can be added to a request:

2.3 Response

Status Code

After sending a request, you will receive a response, including a status code, response header, and response body.

A status code is a group of digits, ranging from 1xx to 5xx. It indicates the status of a request. For more information, see **Status Codes**.

Response Header

Similar to a request, a response also has a header, for example, **Content-Type**. **Table 2-3** list the response header parameters.

Table 2-3 Response header parameters

Parameter	Description
Content-Length	Specifies the length (in bytes) of the response body.
Date	Specifies the time when a response is returned.
Content-type	Specifies the MIME type of the response body.

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Parameter	Description
TraceID	Specifies the ID returned by the request, facilitating fault locating.

Response Body

The body of a response is often returned in structured format as specified in the **Content-Type** header field. The response body transfers content except the response header.

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3 Management Plane APIs (V2)

3.1 System Management

3.1.1 Viewing Quotas

Function

This API is used to query the tenant quotas.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

GET /v2/{project_id}/graphs/quotas

Table 3-1 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

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Request Parameters

Table 3-2 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

Table 3-3 Response body parameters

Parameter	Type	Description
quotas	**quotas** Object	Resource type list. This field is left blank when the request fails.

Table 3-4 quotas

Parameter	Type	Description
resources	Array of **resources** objects	GES resource quota list

Table 3-5 resources

Parameter	Type	Description
type	String	Quota type Options: • "graph" • "backup" • "metadata"
available	Integer	Number of available graphs
edge_volume	Integer	Number of available edges. The parameter value is valid only when **type** is **graph**.

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Status code: 400

Table 3-6 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.

Example Request

Query tenant quotas.

```
GET https://Endpoint/v2/{project_id}/graphs/quotas
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "quotas" : {
    "resources" : [ {
      "type" : "graph",
      "available" : 10,
      "edge_volume" : 7300
    }, {
      "type" : "backup",
      "available" : 100
    }, {
      "type" : "metadata",
      "available" : 86
    } ]
  }
}
```

Status code: 400

Example response for a failed request

```
{
  "error_code" : "GES.7006",
  "error_msg" : "An internal error occurs in the underlying service of the graph engine."
}
```

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Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

3.2 Graph Management

3.2.1 Querying the Graph List

Function

This API is used to query all graphs of the current tenant.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

GET /v2/{project_id}/graphs

Table 3-7 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

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Table 3-8 Query parameters

Parameter	Mandatory	Type	Description
offset	No	Integer	Start position of the request. The default value is **0**.
limit	No	Integer	Maximum number of resources displayed on a single page. The default value is **10**.

Request Parameters

Table 3-9 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

Table 3-10 Response body parameters

Parameter	Type	Description
graph_count	Integer	Total number of graphs. Graph object. If the request fails, this parameter is left empty.
graphs	Array of **graphs** objects	Graph list. Graph object. If the request fails, this parameter is left empty.

Table 3-11 graphs

Parameter	Type	Description
id	String	Graph ID
name	String	Graph name

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Parameter	Type	Description
created_by	String	IAM username
is_multi_az	String	Whether cross-AZ HA will be enabled
region_code	String	Region code
az_code	String	AZ code
schema_path	Array of **schema_path** objects	Path for storing the metadata file
edgeset_path	Array of **edgeset_path** objects	OBS path for storing the edge data set
vertexset_path	Array of **vertexset_path** objects	OBS path for storing the vertex data set
edgeset_format	String	Format of the edge data file
edgeset_default_label	String	Default label of the edge data file
vertexset_format	String	Format of the vertex data file
vertexset_default_label	String	Default label of the vertex data file
data_store_version	String	Graph version
sys_tags	Array of strings	Enterprise project information. If this parameter is not specified, this function is disabled (default).

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Parameter	Type	Description
status	String	Status code of a graph • **100**: A graph is being prepared. • **200**: A graph is running. • **201**: A graph is upgrading. • **202**: A graph is being imported. • **203**: A graph is being rolled back. • **204**: A graph is being exported. • **205**: A graph is being cleared. • **206**: The system is preparing for resize. • **207**: The resize is in progress. • **208**: The resize is being rolled back. • **210**: The system is preparing for expansion. • **211**: The system is expanding the graph. • **300**: A graph is faulty. • **303**: A graph fails to be created. • **400**: A graph is deleted. • **800**: A graph is frozen. • **900**: A graph is stopped. • **901**: A graph is being stopped. • **920**: A graph is being started.
action_progress	String	Progress of graph creation **NOTE** This field is returned only when **status** is **100**.
graph_size_type_index	String	Graph size type index • **0**: Ten-thousand-edge • **1**: Million-edge • **2**: Ten-million-edge • **3**: Hundred-million-edge • **4**: Billion-edge • **5**: Ten-billion-edge • **6**: database edition • **401**: Billion-edge-pro
vpc_id	String	VPC ID
subnet_id	String	Subnet ID in the VPC
security_group_id	String	Security group ID
replication	Integer	Number of replicas. The default value is **1**.

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Parameter	Type	Description
created	String	Time when a graph is created
updated	String	Time when a graph is updated
private_ip	String	Floating IP address of a graph instance. Users can access the instance using the IP address through the ECS deployed on a private network.
public_ip	String	Public network access address of a graph instance. Users can access the instance using the IP address from the Internet.
arch	String	Graph instance's CPU architecture type. The value can be **x86_64** or **aarch64**.
encrypted	Boolean	Whether to encrypt backup data. The default value is **false**, indicating that the backup data is not encrypted.
master_key_id	String	User master key ID
master_key_name	String	User master key name
enable_rbac	Boolean	Whether to enable granular permission control
enable_full_text_index	Boolean	Whether to enable full-text indexes
enable_hyg	Boolean	Whether to enable HyG. This parameter is available only for database edition graphs.
traffic_ip_list	Array of strings	Physical addresses of a graph instance for access from private networks. To prevent service interruption caused by floating IP address switchover, poll the physical IP addresses to access the graph instance.
crypt_algorithm	String	Graph instance cryptography algorithm. Options: • **generalCipher**: Chinese cryptographic algorithm • **SMcompatible**: Commercial cryptography algorithm (compatible with international ones)
enable_https	Boolean	Whether to enable the security mode. This mode may damage GES performance greatly.
tags	Array of **tags** objects	Tag list. Each tag is in <key,value> format.

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Parameter	Type	Description
product_type	String	Graph type. The value can be **InMemory** (default value) or **Persistence**. If **graph_size_type_index** is **6**, the value must be **Persistence**. • **InMemory**: memory edition • **Persistence**: database version
vertex_id_type	**vertex_id_type** object	ID type of vertices. This parameter is mandatory only for database edition graphs. **NOTE** The vertex ID type cannot be changed once set. Exercise caution when setting this parameter.
origin_graph_size_type_index	String	Initial size of a graph. This parameter is returned in versions later than 2.3.15.
expand_time	String	Time when a graph is expanded.
resize_time	String	Time when a graph is resized.
enable_multi_label	Boolean	Whether multi-labeling is enabled.

Table 3-12 schema_path

Parameter	Type	Description
job_id	String	Job ID corresponding to OBS file import
path	String	OBS storage path, excluding OBS endpoint
status	String	OBS file status. Options: • **success**: Imported successfully. • **partiallyFailed**: Partially failed. • **failed**: Failed to import the file.

Table 3-13 edgeset_path

Parameter	Type	Description
job_id	String	Job ID corresponding to OBS file import
path	String	OBS storage path, excluding OBS endpoint

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Parameter	Type	Description
status	String	OBS file status. Options: • **success**: Imported successfully. • **partiallyFailed**: Partially failed. • **failed**: Failed to import the file.

Table 3-14 vertexset_path

Parameter	Type	Description
job_id	String	Job ID corresponding to OBS file import
path	String	OBS storage path, excluding OBS endpoint
status	String	OBS file status. Options: • **success**: Imported successfully. • **partiallyFailed**: Partially failed. • **failed**: Failed to import the file.

Table 3-15 tags

Parameter	Type	Description
key	String	Tag key
value	String	Tag value

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Table 3-16 vertex_id_type

Parameter	Type	Description
id_type	String	Vertex ID type. The value can be **fixedLengthString** or **hash**. • **fixedLengthString**: Vertex IDs are used for internal storage and compute. Specify the length limit. If the IDs are too long, the query performance can be reduced. Specify the length limit based on your dataset vertex IDs. • **hash**: Vertex IDs are converted into hash code for storage and compute. There is no limit on the ID length. However, there is an extremely low probability, approximately 10^(-43), that the vertex IDs will conflict. If you cannot determine the maximum length of a vertex ID, set this parameter to **Hash**.
id_length	Integer	This parameter is mandatory if **id_type** is **fixedLengthString**. The value ranges from 1 to 128.

Status code: 400

Table 3-17 Response body parameters

Parameter	Type	Description
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.

Example Request

Query all graphs of the current tenant.

```
GET https://Endpoint/v2/{project_id}/graphs?offset=0&limit=10
```

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Example Response

Status code: 200

Example response for a successful request


```
{
  "graph_count" : 2,
  "graphs" : [ {
    "id" : "146227d2-bfac-499a-97df-df475349e43d",
    "name" : "TenThousand_Charging",
    "created_by" : "ei_ges_j00356469_01",
    "is_multi_az" : "false",
    "region_code" : "xxxx",
    "az_code" : "xxxx",
    "edgeset_format" : "",
    "edgeset_default_label" : "",
    "vertexset_format" : "",
    "vertexset_default_label" : "",
    "data_store_version" : "2.3.2",
    "sys_tags" : [ "0" ],
    "status" : "200",
    "graph_size_type_index" : "0",
    "vpc_id" : "0ac6e3c3-2c9b-4296-84f7-6883cebc7b41",
    "subnet_id" : "2b1755eb-d6d4-421f-88c0-cf6f0bc16801",
    "security_group_id" : "7aa7c8c9-7443-4a01-abf5-8064b586f8f5",
    "replication" : 1,
    "created" : "2022-04-26T02:19:54",
    "private_ip" : "192.168.0.228",
    "arch" : "x86_64",
    "encrypted" : false,
    "master_key_id" : "",
    "master_key_name" : "",
    "enable_rbac" : false,
    "enable_full_text_index" : false,
    "enable_hyg" : false,
    "traffic_ip_list" : [ "192.168.0.228" ],
    "crypt_algorithm" : "generalCipher",
    "enable_https" : false,
    "origin_graph_size_type_index": "1",
    "expand_time": "2023-08-03T02:10:52",
    "resize_time": "2023-08-02T02:10:52"
  }, {
    "id" : "1172f16c-63c7-4746-89b0-78972eddf706",
    "name" : "GES_UI_2_0_1",
    "created_by" : "ei_ges_j00356469_01",
    "is_multi_az" : "false",
    "region_code" : "xxxx",
    "az_code" : "xxxx",
    "edgeset_format" : "",
    "edgeset_default_label" : "",
    "vertexset_format" : "",
    "vertexset_default_label" : "",
    "data_store_version" : "2.0.1",
    "sys_tags" : [ "0" ],
    "status" : "900",
    "graph_size_type_index" : "0",
    "vpc_id" : "0ac6e3c3-2c9b-4296-84f7-6883cebc7b41",
    "subnet_id" : "2b1755eb-d6d4-421f-88c0-cf6f0bc16801",
    "security_group_id" : "7aa7c8c9-7443-4a01-abf5-8064b586f8f5",
    "replication" : 1,
    "created" : "2022-04-26T02:10:52",
    "private_ip" : "192.168.0.123",
    "encrypted" : false,
    "enable_rbac" : false,
    "enable_full_text_index" : false,
    "enable_hyg" : false,
    "traffic_ip_list" : [ "192.168.0.123" ],
    "crypt_algorithm" : "generalCipher",
    "enable_https" : false,
```


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```
    "origin_graph_size_type_index": "1",
    "expand_time": "2023-08-03T02:10:52",
    "resize_time": "2023-08-02T02:10:52"
  } ]
}
```

Status code: 400

Example response for a failed request

```
{
  "error_code" : "GES.7006",
  "error_msg" : "An internal error occurs in the underlying service of the graph engine."
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

3.2.2 Querying Graph Details

Function

This API is used to query graph details by graph ID.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

GET /v2/{project_id}/graphs/{graph_id}

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Table 3-18 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

Request Parameters

Table 3-19 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

Table 3-20 Response body parameters

Parameter	Type	Description
graph	**graph** object	Graph object. If the request fails, this parameter is left empty.

Table 3-21 graph

Parameter	Type	Description
id	String	Graph ID
name	String	Graph name
created_by	String	IAM username
is_multi_az	String	Whether to enable cross-AZ HA
region_code	String	Region code

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Parameter	Type	Description
az_code	String	AZ code
schema_path	Array of **schema_path** objects	Path for storing the metadata file
edgeset_path	Array of **edgeset_path** objects	OBS path for storing the edge data set
vertexset_path	Array of **vertexset_path** objects	OBS path for storing the vertex data set
edgeset_format	String	Format of the edge data file
edgeset_default_label	String	Default label of the edge data file
vertexset_format	String	Format of the vertex data file
vertexset_default_label	String	Default label of the vertex data file
data_store_version	String	Graph version
sys_tags	Array of strings	Enterprise project information. If this parameter is not specified, this function is disabled (default).

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Parameter	Type	Description
status	String	Status code of a graph. Options: • **100**: A graph is being prepared. • **200**: A graph is running. • **201**: A graph is upgrading. • **202**: A graph is being imported. • **203**: A graph is being rolled back. • **204**: A graph is being exported. • **205**: A graph is being cleared. • **206**: The system is preparing for resize. • **207**: The resize is in progress. • **208**: The resize is being rolled back. • **210**: The system is preparing for expansion. • **211**: The system is expanding the graph. • **300**: A graph is faulty. • **303**: A graph fails to be created. • **400**: A graph is deleted. • **800**: A graph is frozen. • **900**: A graph is stopped. • **901**: A graph is being stopped. • **920**: A graph is being started.
action_progress	String	Progress of graph creation **NOTE** This field is returned only when **status** is **100**.
graph_size_type_index	String	Graph size type index: • **0**: Ten-thousand-edge • **1**: Million-edge • **2**: Ten-million-edge • **3**: Hundred-million-edge • **4**: Billion-edge • **5**: Ten-billion-edge • **6**: database edition • **401**: Billion-edge-pro
vpc_id	String	VPC ID
subnet_id	String	Subnet ID in the VPC
security_group_id	String	Security group ID
replication	Integer	Number of replicas. The default value is **1**.

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Parameter	Type	Description
created	String	Time when a graph is created
updated	String	Time when a graph is updated
private_ip	String	Floating IP address of a graph instance. Users can access the instance using the IP address through the ECS deployed on a private network.
public_ip	String	Public network access address of a graph instance. Users can access the instance using the IP address from the Internet.
arch	String	Graph instance's CPU architecture type. The value can be **x86_64** or **aarch64**.
encrypted	Boolean	Whether to encrypt backup data. The default value is **false**, indicating that the backup data is not encrypted.
master_key_id	String	User master key ID
master_key_name	String	User master key name
enable_rbac	Boolean	Whether to enable granular permission control
enable_full_text_index	Boolean	Whether to enable full-text indexes
enable_hyg	Boolean	Whether to enable HyG. This parameter is available only for database edition graphs.
traffic_ip_list	Array of strings	Physical addresses of a graph instance for access from private networks. To prevent service interruption caused by floating IP address switchover, poll the physical IP addresses to access the graph instance.
crypt_algorithm	String	Graph instance cryptography algorithm. Options: • **generalCipher**: Chinese cryptographic algorithm • **SMcompatible**: Commercial cryptography algorithm (compatible with international ones)
enable_https	Boolean	Whether to enable the security mode. This mode may damage GES performance greatly.
tags	Array of **tags** objects	Tag list. Each tag is in <key,value> format.

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Parameter	Type	Description
product_type	String	Graph type. The value can be **InMemory** (default value) or **Persistence**. If **graph_size_type_index** is **6**, the value must be **Persistence**. • **InMemory**: memory edition • **Persistence**: database version
vertex_id_type	**vertex_id_type** object	ID type of vertices. This parameter is mandatory only for database edition graphs. **NOTE** The vertex ID type cannot be changed once set. Exercise caution when setting this parameter.
origin_graph_size_type_index	String	Initial size of a graph. This parameter is returned in versions later than 2.3.15.
expand_time	String	Time when a graph is expanded.
resize_time	String	Time when a graph is resized.
enable_multi_label	Boolean	Whether multi-labeling is enabled.

Table 3-22 schema_path

Parameter	Type	Description
job_id	String	Job ID corresponding to OBS file import
path	String	OBS storage path, excluding OBS endpoint
status	String	OBS file status. Options: • **success**: Imported successfully. • **partiallyFailed**: Partially failed. • **failed**: Failed to import the file.

Table 3-23 edgeset_path

Parameter	Type	Description
job_id	String	Job ID corresponding to OBS file import
path	String	OBS storage path, excluding OBS endpoint

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Parameter	Type	Description
status	String	OBS file status. Options: • **success**: Imported successfully. • **partiallyFailed**: Partially failed. • **failed**: Failed to import the file.

Table 3-24 vertexset_path

Parameter	Type	Description
job_id	String	Job ID corresponding to OBS file import
path	String	OBS storage path, excluding OBS endpoint
status	String	OBS file status. Options: • **success**: Imported successfully. • **partiallyFailed**: Partially failed. • **failed**: Failed to import the file.

Table 3-25 tags

Parameter	Type	Description
key	String	Tag key.
value	String	Tag value

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Table 3-26 vertex_id_type

Parameter	Type	Description
id_type	String	Vertex ID type. The value can be **fixedLengthString** or **hash**. • **fixedLengthString**: Vertex IDs are used for internal storage and compute. Specify the length limit. If the IDs are too long, the query performance can be reduced. Specify the length limit based on your dataset vertex IDs. • **hash**: Vertex IDs are converted into hash code for storage and compute. There is no limit on the ID length. However, there is an extremely low probability, approximately 10^(-43), that the vertex IDs will conflict. If you cannot determine the maximum length of a vertex ID, set this parameter to **Hash**.
id_length	Integer	This parameter is mandatory if **id_type** is **fixedLengthString**. The value ranges from 1 to 128.

Status code: 400

Table 3-27 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Query graph details by graph ID.

```
GET https://Endpoint/v2/{project_id}/graphs/{graph_id}
```

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Example Response

Status code: 200

Example response for a successful request


```
{
  "graph" : {
    "id" : "1172f16c-63c7-4746-89b0-78972eddf706",
    "name" : "GES_UI_2_0_1",
    "created_by" : "ei_ges_j00356469_01",
    "is_multi_az" : "false",
    "region_code" : "xxxx",
    "az_code" : "xxxx",
    "edgeset_format" : "",
    "edgeset_default_label" : "",
    "vertexset_format" : "",
    "vertexset_default_label" : "",
    "data_store_version" : "2.0.1",
    "sys_tags" : [ "0" ],
    "status" : "900",
    "graph_size_type_index" : "0",
    "vpc_id" : "0ac6e3c3-2c9b-4296-84f7-6883cebc7b41",
    "subnet_id" : "2b1755eb-d6d4-421f-88c0-cf6f0bc16801",
    "security_group_id" : "7aa7c8c9-7443-4a01-abf5-8064b586f8f5",
    "replication" : 0,
    "created" : "2022-04-26T02:10:52",
    "updated" : "2022-04-26T02:10:52",
    "private_ip" : "192.168.0.123",
    "encrypted" : false,
    "enable_rbac" : false,
    "enable_full_text_index" : false,
    "enable_hyg" : false,
    "traffic_ip_list" : [ "192.168.0.123" ],
    "crypt_algorithm" : "generalCipher",
    "enable_https" : false,
    "origin_graph_size_type_index": "1",
    "expand_time": "2023-08-03T02:10:52",
    "resize_time": "2023-08-02T02:10:52"
  }
}
```


Status code: 400

Example response for a failed request


```
{
  "error_code" : "GES.7006",
  "error_msg" : "An internal error occurs in the underlying service of the graph engine."
}
```


Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.

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Return Value	Description
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

3.2.3 Creating a Graph

Function

This API is used to create a graph.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs

Table 3-28 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

Request Parameters

Table 3-29 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

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Table 3-30 Request body parameter

Parameter	Mandatory	Type	Description
graph	Yes	**graph** object	Graph type

Table 3-31 graph

Parameter	Mandatory	Type	Description
name	Yes	String	A graph name must start with a letter and contains 4 to 50 characters consisting of letters, digits, hyphens (-), and underscores (_). It cannot contain special characters.
graph_size_type_index	Yes	String	Graph size type index: • **0**: Ten-thousand-edge • **1**: Million-edge • **2**: Ten-million-edge • **3**: Hundred-million-edge • **4**: Billion-edge • **5**: Ten-billion-edge • **6**: database edition • **401**: Billion-edge-pro
arch	No	String	Graph instance's CPU architecture type. The value can be **x86_64** or **aarch64**. The default value is **x86_64**. • **x86_64**: x86 64-bit architecture • **aarch64**: Arm 64-bit architecture
vpc_id	Yes	String	VPC ID
subnet_id	Yes	String	Subnet ID in the VPC
security_group_id	Yes	String	Security group ID
public_ip	No	**public_ip** object	Public IP address. If the parameter is not specified, public connection is not used by default.

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Parameter	Mandatory	Type	Description
enable_multi_az	No	Boolean	Whether the created graph supports the cross-AZ mode. The default value is **false**. If the value is **true**, the system will create the ECSs in the graph in two AZs. If this parameter is not specified when you create a graph, all ECSs in the graph are created in one AZ.
encryption	No	**encryption** object	Whether to encrypt the graph instance. The graph instance is not encrypted by default.
lts_operation_trace	No	**lts_operation_trace** object	Whether to enable audit logs. This function is disabled by default.
sys_tags	No	Array of **sys_tags** objects	Enterprise project information. If this parameter is not specified, this function is disabled (default).
tags	No	Array of **tags** objects	TMS tags for expenses. This function is disabled by default.
enable_rbac	No	Boolean	Whether to enable granular permission control for the created graph. The default value is **false**, indicating that granular permission control is disabled. If this parameter is set to **true**, no user has the permission to access the graph. To access the graph, you need to call the granular permission control API of the service plane to set the required permissions.

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Parameter	Mandatory	Type	Description
enable_full_text_index	No	Boolean	Whether to enable full-text index control for the created graph. The default value is **false**, indicating that full-text index control is disabled. If this parameter is set to **true**, full-text indexes are available for 1-billion-edge-pro graphs, and a Cloud Search Service (CSS) cluster will be created when you create a graph. **NOTE** If you enable full-text indexes: If the CSS has been deployed, the system automatically creates a CSS cluster during the creation of the graph instance, which will take a long time. If the CSS is not deployed, the graph creation will fail.
enable_hyg	No	Boolean	Whether to enable HyG for the graph. This parameter is available for database edition graphs only.
crypt_algorithm	Yes	String	Graph instance cryptography algorithm. Options: • **generalCipher**: Chinese cryptographic algorithm • **SMcompatible**: Commercial cryptography algorithm (compatible with international ones)
enable_https	Yes	Boolean	Whether to enable the security mode. This mode may damage GES performance greatly.
product_type	No	String	Graph type. The value can be **InMemory** (default value) or **Persistence**. If **graph_size_type_index** is **6**, the value must be **Persistence**. • **InMemory**: memory edition • **Persistence**: database version

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Parameter	Mandatory	Type	Description
vertex_id_type	No	vertex_id_type object	ID type of vertices. This parameter is mandatory only for database edition graphs. **NOTE** The vertex ID type cannot be changed once set. Exercise caution when setting this parameter.
enable_multi_label	No	Boolean	Whether multi-labeling is enabled.

Table 3-32 public_ip

Parameter	Mandatory	Type	Description
public_bind_type	No	String	Binding type of an EIP. The value can be either of the following: • **auto_assign** • **bind_existing**
eip_id	No	String	ID of an EIP. When **publicBindType** is set to **bind_existing**, its value is the ID of an EIP that has been created but has not been bound. When **publicBindType** is set to **auto_assign**, its value is set to null.

Table 3-33 encryption

Parameter	Mandatory	Type	Description
enable	No	Boolean	Whether to enable data encryption The value can be **true** or **false**. The default value is **false**.
master_key_id	No	String	ID of the user master key created by Data Encryption Workshop (DEW) in the project in which the graph is created.

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Table 3-34 lts_operation_trace

Parameter	Mandatory	Type	Description
enable_audit	No	Boolean	Whether to enable graph audit. The default value is **false**.
audit_log_group_name	No	String	LTS log group name

Table 3-35 sys_tags

Parameter	Mandatory	Type	Description
key	No	String	Key of the enterprise project. The value is **_sys_enterprise_project_id**.
value	No	String	Enterprise project ID. You can obtain it from the enterprise project.

Table 3-36 tags

Parameter	Mandatory	Type	Description
key	No	String	Tag key
value	No	String	Tag value

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Table 3-37 vertex_id_type

Parameter	Mandatory	Type	Description
id_type	Yes	String	Vertex ID type. The value can be **fixedLengthString** or **hash**. • **fixedLengthString**: Vertex IDs are used for internal storage and compute. Specify the length limit. If the IDs are too long, the query performance can be reduced. Specify the length limit based on your dataset vertex IDs. • **hash**: Vertex IDs are converted into hash code for storage and compute. There is no limit on the ID length. However, there is an extremely low probability, approximately 10^(-43), that the vertex IDs will conflict. If you cannot determine the maximum length of a vertex ID, set this parameter to **Hash**.
id_length	No	Integer	This parameter is mandatory if **id_type** is **fixedLengthString**. The value ranges from 1 to 128.

Response Parameters

Status code: 200

Table 3-38 Response body parameters

Parameter	Type	Description
id	String	Graph ID
name	String	Graph name

Status code: 400

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Table 3-39 Response body parameters

Parameter	Type	Description
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.

Example Request

Create a graph. The graph name is **demo**, the graph size is million-edge, the graph instance CPU architecture type is x86 64-bit, the VPC ID is **2d8af840-fd57-4e3b-a8f1-cda0f55ccd99**, the subnet ID is **dc018ec3-67d1-46c9-b2fc-19d83367f4e2**, and the security group ID is **11d27338-8649-4076-8579-5ebc1a60f79e**.

```
POST https://Endpoint/v2/{project_id}/graphs

{
  "graph" : {
    "name" : "demo",
    "graph_size_type_index" : "1",
    "arch" : "x86_64",
    "vpc_id" : "2d8af840-fd57-4e3b-a8f1-cda0f55ccd99",
    "subnet_id" : "dc018ec3-67d1-46c9-b2fc-19d83367f4e2",
    "security_group_id" : "11d27338-8649-4076-8579-5ebc1a60f79e",
    "public_ip" : {
      "public_bind_type" : "bind_existing",
      "eip_id" : "30ef2d58-08a9-4481-b526-b2cbe67d020d"
    },
    "enable_multi_az" : false,
    "encryption" : {
      "enable" : true,
      "master_key_id" : "b00b9356-73fb-4d49-8f79-f0a5da5354d1"
    },
    "lts_operation_trace" : {
      "enable_audit" : true,
      "audit_log_group_name" : "test"
    },
    "sys_tags" : [ {
      "key" : "_sys_enterprise_project_id",
      "value" : "54c0b33c-8627-462f-948e-bae08c0887b4"
    } ],
    "enable_rbac" : true,
    "enable_full_text_index" : true,
    "enable_hyg" : true,
    "crypt_algorithm" : "generalCipher",
    "enable_https" : false
  }
}
```

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Example Response

Status code: 200

Example response for a successful request

```
{
  "id" : "f1529b88-c958-493e-8452-fccfe932cde1",
  "name" : "demo"
}
```

Status code: 400

Example response for a failed request

```
{
  "error_code" : "GES.7016",
  "error_msg" : "The parameter [subnetId] is not exist."
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

3.2.4 Closing a Graph

Function

This API is used to close a graph. After the graph is created, you can disable it if it is not used temporarily.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/{graph_id}/stop

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Table 3-40 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

Request Parameters

Table 3-41 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

Table 3-42 Response body parameters

Parameter	Type	Description
job_id	String	ID of the graph stopping job. Graph object. If the request fails, this parameter is left empty.

Table 3-43 Response body parameters

Parameter	Type	Description
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

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Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.

Example Request

Close a graph.

```
POST https://Endpoint/v2/{project_id}/graphs/{graph_id}/stop
{ }
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_id" : "ff8080816025a0a1016025a5a2700007"
}
```

Status code: 400

Example response for a failed request

```
{
  "error_code" : "GES.7001",
  "error_msg" : "The graph is not running."
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

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3.2.5 Starting a Graph

Function

This API is used to start a graph. You can disable a graph if it is not used temporarily.

URI

POST /v2/{project_id}/graphs/{graph_id}/start

Table 3-44 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

Request Parameters

Table 3-45 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Table 3-46 Request body parameters

Parameter	Mandatory	Type	Description
graph_backup_id	No	String	Backup ID associated during graph startup. If this parameter is configured, the graph starts from the backup. If this parameter is left blank, the graph starts from the status when it was closed last time.

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Response Parameters

Status code: 200

Table 3-47 Response body parameters

Parameter	Type	Description
job_id	String	ID of the graph startup job. This parameter is left blank when the request fails.

Status code: 400

Table 3-48 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Start a graph whose associated backup ID is **08a898ae-3ff8-40e8-a7ed-03afe05aedbb**.

```
POST https://Endpoint/v2/{project_id}/graphs/{graph_id}/start

{
  "graph_backup_id" : "08a898ae-3ff8-40e8-a7ed-03afe05aedbb"
}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_id" : "ff8080816025a0a1016025a5a2700007"
}
```

Status code: 400

Example response for a failed request

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```
{
  "error_code" : "GES.7006",
  "error_msg" : "An internal error occurs in the underlying service of the graph engine."
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.2.6 Deleting a Graph

Function

This API is used to delete a graph.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

DELETE /v2/{project_id}/graphs/{graph_id}

Table 3-49 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

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Table 3-50 Query parameters

Parameter	Mandatory	Type	Description
keep_backup	No	Boolean	Whether to retain the backups of a graph after it is deleted. By default, one automatic backup and two manual backups are retained. If this parameter is left empty, no backups are retained.

Request Parameters

Table 3-51 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

Table 3-52 Response body parameters

Parameter	Type	Description
job_id	String	ID of the graph deletion job. This parameter is left blank when the request fails.

Status code: 400

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Table 3-53 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Delete a graph.

```
DELETE https://Endpoint/v2/{project_id}/graphs/{graph_id}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_id" : "ff8080816025a0a1016025a5a2700007"
}
```

Status code: 400

Example response for a failed request

```
{
  "error_code" : "GES.7000",
  "error_msg" : "The graph does not exist or has been deleted."
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

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Error Codes

See **Error Codes for Service Plane APIs**.

3.2.7 Incrementally Importing Data to a Graph

Function

This API is used to import data to graphs incrementally.

NOTE

To prevent failures in restoring the imported graph data during system restarting, do not delete the data stored on OBS when the graph is in use.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/{graph_id}/import-graph

Table 3-54 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

Request Parameters

Table 3-55 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

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Table 3-56 Request body parameters

Parameter	Mandatory	Type	Description
edgeset_path	No	String	Edge file directory or name
edgeset_format	No	String	Format of the edge data set. Currently, only the CSV format is supported. The CSV format is used by default.
vertexset_path	No	String	Vertex file directory or name
vertexset_format	No	String	Format of the vertex data set. Currently, only the CSV format is supported. The CSV format is used by default.
schema_path	No	String	Path for storing the metadata file of the new data.
log_dir	No	String	Directory for storing logs of imported graphs. This directory stores the data that fails to be imported during graph creation and detailed error causes.
parallel_edge	No	**parallel_edge** object	How to process repetitive edges.
delimiter	No	String	Field separator in a CSV file. The default value is comma (,). The default element separator in a field of the list/set type is semicolon (;).
trim_quote	No	String	Field quote character in a CSV file. The default value is double quotation marks ("). They are used to enclose a field if the field contains separators or line breaks.

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Parameter	Mandatory	Type	Description
offline	No	Boolean	Whether offline import is selected. The value is **true** or **false**, and the default value is **false**. • **true**: Offline import is selected. The import speed is high, but the graph is locked and cannot be read or written during the import. • **false**: Online import is selected. Compared with offline import, online import is slower. However, the graph can be read (cannot be written) during the import.

Table 3-57 parallel_edge

Parameter	Mandatory	Type	Description
action	No	String	Processing mode of repetitive edges. The value can be **allow**, **ignore**, or **override**. The default value is **allow**. • **allow** indicates that repetitive edges are allowed. • **ignore** indicates that subsequent repetitive edges are ignored. • **override** indicates that the previous repetitive edges are overwritten.

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Parameter	Mandatory	Type	Description
ignore_label	No	Boolean	Whether to ignore labels on repetitive edges. The value is **true** or **false**, and the default value is **true**. • **true**: Indicates that the repetitive edge definition does not contain the label. That is, the <source vertex, target vertex> indicates an edge, excluding the label information. • **false**: Indicates that the repetitive edge definition contains the label. That is, the <source vertex, target vertex, label> indicates an edge.

Response Parameters

Status code: 200

Table 3-58 Response body parameters

Parameter	Type	Description
job_id	String	ID of an asynchronous job

Status code: 400

Table 3-59 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

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Example Request

Incrementally import graph data. The edge file directory is **testbucket/demo_movie/edges/** and the edge data set is in CSV format. The vertex file directory is **testbucket/demo_movie/vertices/** and the vertex data set is in CSV format.

```
POST http://Endpoint/v2/{project_id}/graphs/{graph_id}/import-graph

{
  "edgeset_path" : "testbucket/demo_movie/edges/",
  "edgeset_format" : "csv",
  "vertexset_path" : "testbucket/demo_movie/vertices/",
  "vertexset_format" : "csv",
  "schema_path" : "testbucket/demo_movie/incremental_data_schema.xml",
  "log_dir" : "testbucket/importlogdir",
  "parallel_edge" : {
    "action" : "override",
    "ignore_label" : true
  },
  "delimiter" : ",",
  "trim_quote" : "\"",
  "offline" : false
}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_id" : "b4f2e9a0-0439-4edd-a3ad-199bb523b613"
}
```

Status code: 400

Example response for a failed request

```
{
  "error_msg" : "parameter format error",
  "error_code" : "GES.8013"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

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Error Codes

See **Error Codes**.

3.2.8 Exporting a Graph

Function

This API is used to unbind an EIP.

NOTE

The database edition 2.3.14 or later supports this function.

Debugging

1. You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/{graph_id}/export-graph

Table 3-60 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

Request Parameters

Table 3-61 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

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Table 3-62 Request body parameters

Parameter	Mandatory	Type	Description
graph_export_path	Yes	String	OBS path to which a graph is exported
edge_set_name	Yes	String	Exported edge file name
vertex_set_name	Yes	String	Exported vertex file name
schema_name	Yes	String	Name of the exported metadata file
paginate	No	**paginate** object	Pagination-related parameters. In memory edition 2.3.11 or later, graphs are exported on multiple pages by default.

Table 3-63 paginate

Parameter	Mandatory	Type	Description
enable	No	Boolean	Whether to enable pagination. The default value is **true**. If pagination is not required, set this parameter to **false**. **NOTE** This parameter is unavailable for database editions.
row_count_per_file	No	Integer	Maximum number of rows in each file when graphs are exported by page. The default value is **10000000**.
num_thread	No	Integer	Number of concurrent threads when graphs are exported by page. The default value is **8**.

Response Parameters

Status code: 200

Table 3-64 Response body parameters

Parameter	Type	Description
job_id	String	ID of an asynchronous job

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Status code: 400

Table 3-65 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Export a graph. The OBS path for exporting the graph is **demo_movie/**, the name of the exported edge file is **set_edge.csv**, the name of the exported vertex file is **set_vertex.csv**, and the name of the exported metadata file is **set_schema.xml**.

```
POST http://Endpoint/v2/{project_id}/graphs{graph_id}/export-graph

{
  "graph_export_path" : "demo_movie/",
  "edge_set_name" : "set_edge.csv",
  "vertex_set_name" : "set_vertex.csv",
  "schema_name" : "set_schema.xml"
}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_id" : "f99f60f1-bba6-4cde-bd1a-ff4bdd1fd500000168232"
}
```

Status code: 400

Example response for a failed request

```
{
  "error_msg" : "graph [demo] is not found",
  "error_code" : "GES.8011"
}
```

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Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.2.9 Clearing a Graph

Function

This API is used to clear all data in a graph.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/{graph_id}/clear-graph

Table 3-66 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

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Table 3-67 Query parameters

Parameter	Mandatory	Type	Description
clear_metadata	No	Boolean	Whether to clear graph metadata. Set this parameter to **true**. The value can be **true** or **false**. The default value is **false**. • **true**: The metadata will be cleared. • **false**: The metadata will not be cleared.

Request Parameters

Table 3-68 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

Table 3-69 Response body parameters

Parameter	Type	Description
job_id	String	ID of an asynchronous job **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.

Status code: 400

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Table 3-70 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Clear all data in a graph.

```
POST http://Endpoint/v2/{project_id}/graphs/{graph_id}/clear-graph?clear_metadata=true

{ }
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_id" : "ff8080816025a0a1016025a5a2700007"
}
```

Status code: 400

Example response for a failed request

```
{
  "error_msg" : "graph [demo] is not found",
  "error_code" : "GES.8012"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.

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Return Value	Description
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.2.10 Upgrading a Graph

Function

This API is used to upgrade a graph. The GES version is periodically upgraded. You can upgrade your graphs as required.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/{graph_id}/upgrade

Table 3-71 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

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Request Parameters

Table 3-72 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Table 3-73 Request body parameters

Parameter	Mandatory	Type	Description
upgrade_version	Yes	String	Target version, which must be later than the current version
force_upgrade	No	Boolean	Whether to upgrade forcibly. The value is **true** or **false**, and the default value is **false**. • **true**: forcible upgrades, which will interrupt running tasks, such as long algorithm execution tasks. As a result, a small number of requests may fail. • **false**: non-forcible upgrades, which will wait for running services to complete. The upgrade process may be slow.

Response Parameters

Status code: 200

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Table 3-74 Response body parameters

Parameter	Type	Description
job_id	String	ID of an asynchronous job **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.

Status code: 400

Table 3-75 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Upgrade a graph to version 1.1.8 as needed.

```
POST http://Endpoint/v2/{project_id}/graphs{graph_id}/upgrade

{
  "upgrade_version" : "1.1.8",
  "force_upgrade" : false
}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_id" : "f99f60f1-bba6-4cde-bd1a-ff4bdd1fd500000168232"
}
```

Status code: 400

Example response for a failed request

```
{
  "error_msg" : "graph [demo] is not found",
```

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```
  "error_code" : "GES.8011"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.2.11 Binding an EIP

Function

This API enables you to access GES by binding an elastic IP (EIP).

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/{graph_id}/bind-eip

Table 3-76 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

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Request Parameters

Table 3-77 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Table 3-78 Request body parameters

Parameter	Mandatory	Type	Description
eip_id	Yes	String	ID of the elastic IP address.

Response Parameters

Status code: 200

None

Status code: 400

Table 3-79 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

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Example Request

Bind an EIP to access GES. The ID of the EIP is **02bd6dc1-5be8-430e-a4cd-2b0f6d0bb042**.

```
POST http://Endpoint/v2/{project_id}/graphs{graph_id}/bind-eip

{
  "eip_id" : "02bd6dc1-5be8-430e-a4cd-2b0f6d0bb042"
}
```

Example Response

Status code: 200

Example response for a successful request

```
{ }
```

Status code: 400

Example response for a failed request

```
{
  "error_msg" : "graph [demo] is not found",
  "error_code" : "GES.8011"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.2.12 Unbinding an EIP

Function

If you do not need to use the EIP, this API enabled you to unbind the EIP to release network resources.

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Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/{graph_id}/unbind-eip

Table 3-80 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

Request Parameters

Table 3-81 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Table 3-82 Request body parameters

Parameter	Mandatory	Type	Description
eip_id	Yes	String	ID of the elastic IP address.

Response Parameters

Status code: 200

None

Status code: 400

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Table 3-83 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Unbind an EIP to release network resources. The ID of the EIP is **02bd6dc1-5be8-430e-a4cd-2b0f6d0bb042**.

```
POST http://Endpoint/v2/{project_id}/graphs{graph_id}/unbind-eip

{
  "eip_id" : "02bd6dc1-5be8-430e-a4cd-2b0f6d0bb042"
}
```

Example Response

Status code: 200

Example response for a successful request

```
{ }
```

Status code: 400

Example response for a failed request

```
{
  "error_msg" : "graph [demo] is not found",
  "error_code" : "GES.8011"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.

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Return Value	Description
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.2.13 Resizing a Graph

Function

This API is used to resize a graph instance.

NOTE

After the graph is resized, you need to re-create all indexes.

URI

POST /v2/{project_id}/graphs/{graph_id}/resize

Table 3-84 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

Request Parameters

Table 3-85 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

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Table 3-86 Request body parameter

Parameter	Mandatory	Type	Description
resize	Yes	**resize** object	Graph specifications after the graph is resized.

Table 3-87 resize

Parameter	Mandatory	Type	Description
graph_size_type_index	Yes	String	Graph size. Currently, the value can be **2**, **3**, **4**, or **5**, indicating **Ten-million-edge**, **Hundred-million-edge**, **Billion-edge**, or **Ten-billion-edge**, respectively.

Response Parameters

Status code: 200

Table 3-88 Response body parameters

Parameter	Type	Description
job_id	String	Indicates the ID of the resize job. This parameter is left blank when the request fails. **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.

Status code: 400

Table 3-89 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.

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Parameter	Type	Description
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Resize a graph instance. The graph size is **ten-million-edge**.

```
POST http://Endpoint/v2/{project_id}/graphs/{graph_id}/resize

{
  "resize" : {
    "graph_size_type_index" : "2"
  }
}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_id" : "ff8080816025a0a1016025a5a2700007"
}
```

Status code: 400

Example response for a failed request

```
{
  "error_msg" : "graph [demo] is not found",
  "error_code" : "GES.8012"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

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Error Codes

See **Error Codes**.

3.2.14 Restarting a Graph

Function

This API is used to forcibly start a graph, especially for running graphs or those are being imported, exported, and cleared. If a graph is forcibly restarted, asynchronous tasks of the graph are failed state and the graph is stopped and started.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/{graph_id}/restart

Table 3-90 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

Request Parameters

Table 3-91 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

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Response Parameters

Status code: 200

Table 3-92 Response body parameters

Parameter	Type	Description
job_id	String	ID of a forcible restart job. This parameter is left blank when the request fails. **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Task Center APIs**.

Status code: 400

Table 3-93 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Forcibly start a graph.

```
POST https://Endpoint/v2/{project_id}/graphs/{graph_id}/restart

{ }
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_id" : "f99f60f1-bba6-4cde-bd1a-ff4bdd1fd500000168232"
}
```

Status code: 400

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Example response for a failed request

```
{
  "error_msg" : "The request is invalid.",
  "error_code" : "GES.7016"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.2.15 Expanding a Graph

Function

This API is used to expand multiple secondary nodes dynamically. The expanded secondary nodes can process read requests, improving read performance.

NOTE

1. This API is not supported by graphs of the 10,000-edge and 10-billion-edge types.
2. Graphs cannot be resized after expansion.
3. If you want to resize and expand the graph, resize the graph before you expand it.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/{graph_id}/expand

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Table 3-94 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

Request Parameters

Table 3-95 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Table 3-96 Request body parameter

Parameter	Mandatory	Type	Description
expand	Yes	**expand** object	**expand** is an object.

Table 3-97 expand

Parameter	Mandatory	Type	Description
replication	Yes	Integer	Number of new nodes to expand

Response Parameters

Status code: 200

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Table 3-98 Response body parameters

Parameter	Type	Description
job_id	String	ID of the expansion job. This parameter is left blank when the request fails. **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Task Center APIs**.

Status code: 400

Table 3-99 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Expand a graph. The number of new replicas is 1.

```
POST http://Endpoint/v2/{project_id}/graphs/{graph_id}/expand

{
    "expand":{
    "replication": 1
  }
}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_id" : "ff8080816025a0a1016025a5a2700007"
}
```

Status code: 400

Example response for a failed request

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```
{
  "error_code" : "GES.7015",
  "error_msg" : "The graph is not running or stopped."
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

3.3 Backup Management

3.3.1 Viewing the List of All Backups

Function

This API is used to query a backup list according to search criteria. Before using this API:

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

GET /v2/{project_id}/graphs/backups

Table 3-100 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

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Table 3-101 Query parameters

Parameter	Mandatory	Type	Description
limit	No	Integer	Maximum number of resources displayed on a single page. The default value is **10**.
offset	No	Integer	Start position of the request. The default value is **0**.

Request Parameters

Table 3-102 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

Table 3-103 Response body parameters

Parameter	Type	Description
backup_count	Integer	Total number of backups. This parameter is left blank when the request fails.
backup_list	Array of **backup_list** objects	List of all backups under the current project ID. This parameter is left blank when the request fails.

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Table 3-104 backup_list

Parameter	Type	Description
id	String	Indicates the backup ID.
name	String	Backup name
backup_method	String	Backup method. The value can be **auto** or **manual**.
graph_id	String	ID of the graph associated with the backup
graph_name	String	Name of the graph associated with the backup
graph_status	String	Status of the graph associated with the backup
graph_size_type_index	String	Size of the graph associated with the backup
data_store_version	String	Version of the graph associated with the backup
arch	String	CPU architecture of the graph node associated with the backup
status	String	Backup status: • **backing_up**: indicates that a graph is being backed up. • **success**: indicates that a graph is successfully backed up. • **failed**: indicates that a graph fails to be backed up.
start_timestamp	Long	Start timestamp of a backup job
start_time	String	Start time of a backup job.
end_timestamp	Long	End timestamp of a backup job
end_time	String	Indicates the backup end time.
size	Long	Backup file size (MB)
duration	Long	Backup duration (seconds)
encrypted	Boolean	Whether to encrypt backup data. The default value is **false**. • **true**: The password will be encrypted. • **false** (default value): The password will not be encrypted.

Status code: 400

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Table 3-105 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Query the list of all backups.

```
GET https://Endpoint/v2/{project_id}/graphs/backups?offset=0&limit=2
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "backup_count" : 3,
  "backup_list" : [ {
    "id" : "ada3e720-ab87-48cb-bff7-3ec5ae1a9652",
    "name" : "ges060803_nodelete-20210608135513",
    "backup_method" : "manual",
    "graph_id" : "4c5f882d-a813-4d78-a8e3-6d3212ddd121",
    "graph_name" : "ges060803_nodelete",
    "graph_status" : "200",
    "graph_size_type_index" : "1",
    "data_store_version" : "2.2.21",
    "arch" : "x86_64",
    "status" : "success",
    "start_timestamp" : 1623160513000,
    "start_time" : "2021-06-08T13:55:13",
    "end_timestamp" : 1623160568000,
    "end_time" : "2021-06-08T13:56:08",
    "size" : 1,
    "duration" : 54,
    "encrypted" : false
  }, {
    "id" : "7ed3f51d-816d-4651-9129-fe21b64b5c91",
    "name" : "ges060803_nodelete_20210609203323_auto",
    "backup_method" : "auto",
    "graph_id" : "4c5f882d-a813-4d78-a8e3-6d3212ddd121",
    "graph_name" : "ges060803_nodelete",
    "graph_status" : "200",
    "graph_size_type_index" : "1",
    "data_store_version" : "2.2.21",
    "arch" : "x86_64",
    "status" : "success",
    "start_timestamp" : 1623242004000,
```

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```
  "start_time" : "2021-06-09T12:33:24",
  "end_timestamp" : 1623242004000,
  "end_time" : "2021-06-09T12:33:24",
  "size" : 1,
  "duration" : 0,
  "encrypted" : false
 }, {
  "id" : "604bfb46-04dd-45fc-a9ae-df24a0705b9d",
  "name" : "ges060802_nodelete-20210608135523",
  "backup_method" : "manual",
  "graph_id" : "9b9a05c2-0cdb-41ac-b55f-93caffb0519a",
  "graph_name" : "ges060802_nodelete",
  "graph_status" : "400",
  "graph_size_type_index" : "0",
  "data_store_version" : "2.2.23",
  "arch" : "x86_64",
  "status" : "success",
  "start_timestamp" : 1623160524000,
  "start_time" : "2021-06-08T13:55:24",
  "end_timestamp" : 1623160577000,
  "end_time" : "2021-06-08T13:56:17",
  "size" : 1,
  "duration" : 53,
  "encrypted" : false
 } ]
}
```


Status code: 400

Example response for a failed request


```
{
  "error_code" : "GES.7006",
  "error_msg" : "The underlying graph engine has internal error."
}
```


Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.3.2 Viewing the Backup List of a Graph

Function

This API is used to query the backup list of a graph.

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Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

GET /v2/{project_id}/graphs/{graph_id}/backups

Table 3-106 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

Table 3-107 Query parameters

Parameter	Mandatory	Type	Description
limit	No	Integer	Maximum number of resources displayed on a single page. The default value is **10**.
offset	No	Integer	Start position of the request. The default value is **0**.

Request Parameters

Table 3-108 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

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Table 3-109 Response body parameters

Parameter	Type	Description
backup_count	Integer	Total number of backups. This parameter is left blank when the request fails.
backup_list	Array of **backup_list** objects	List of all backups under the current project ID. This parameter is left blank when the request fails.

Table 3-110 backup_list

Parameter	Type	Description
id	String	Backup ID
name	String	Backup name
backup_method	String	Backup method. The value can be **auto** or **manual**.
graph_id	String	ID of the graph associated with the backup
graph_name	String	Name of the graph associated with the backup
graph_status	String	Status of the graph associated with the backup
graph_size_type_index	String	Size of the graph associated with the backup
data_store_version	String	Version of the graph associated with the backup
arch	String	CPU architecture of the graph node associated with the backup
status	String	Backup status: • **backing_up**: indicates that a graph is being backed up. • **success**: indicates that a graph is successfully backed up. • **failed**: indicates that a graph fails to be backed up.
start_timestamp	Long	Start timestamp of a backup job
start_time	String	Start time of a backup job.
end_timestamp	Long	End timestamp of a backup job
end_time	String	Indicates the backup end time.

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Parameter	Type	Description
size	Long	Backup file size (MB)
duration	Long	Backup duration (seconds)
encrypted	Boolean	Whether to encrypt backup data. The value **true** indicates that the backup data is encrypted. The default value **false** indicates that the backup data is not encrypted.

Status code: 400

Table 3-111 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Query the backup list of a graph.

```
GET https://Endpoint/v2/{project_id}/graphs/{graph_id}/backups?offset=0&limit=2
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "backup_count" : 2,
  "backup_list" : [ {
    "id" : "ada3e720-ab87-48cb-bff7-3ec5ae1a9652",
    "name" : "ges060803_nodelete-20210608135513",
    "backup_method" : "manual",
    "graph_id" : "4c5f882d-a813-4d78-a8e3-6d3212ddd121",
    "graph_name" : "ges060803_nodelete",
    "graph_status" : "200",
    "graph_size_type_index" : "1",
    "data_store_version" : "2.2.21",
    "arch" : "x86_64",
```

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```
    "status" : "success",
    "start_timestamp" : 1623160513000,
    "start_time" : "2021-06-08T13:55:13",
    "end_timestamp" : 1623160568000,
    "end_time" : "2021-06-08T13:56:08",
    "size" : 1,
    "duration" : 54,
    "encrypted" : false
  }, {
    "id" : "7ed3f51d-816d-4651-9129-fe21b64b5c91",
    "name" : "ges060803_nodelete_20210609203323_auto",
    "backup_method" : "auto",
    "graph_id" : "4c5f882d-a813-4d78-a8e3-6d3212ddd121",
    "graph_name" : "ges060803_nodelete",
    "graph_status" : "200",
    "graph_size_type_index" : "1",
    "data_store_version" : "2.2.21",
    "arch" : "x86_64",
    "status" : "success",
    "start_timestamp" : 1623242004000,
    "start_time" : "2021-06-09T12:33:24",
    "end_timestamp" : 1623242004000,
    "end_time" : "2021-06-09T12:33:24",
    "size" : 1,
    "duration" : 0,
    "encrypted" : false
  } ]
}
```


Status code: 400

Example response for a failed request


```
{
  "error_code" : "GES.7000",
  "error_msg" : "The graph does not exist or has been deleted."
}
```


Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

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3.3.3 Adding a Backup

Function

Add a backup. If data in the current graph is incorrect or faulty, you can start the backup graph to restore the data.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/{graph_id}/backups

Table 3-112 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

Request Parameters

Table 3-113 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

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Table 3-114 Response body parameters

Parameter	Type	Description
job_id	String	ID of the graph backup job. **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Task Center**.

Status code: 400

Table 3-115 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Add a graph backup.

```
POST https://Endpoint/v2/{project_id}/graphs/{graph_id}/backups

{ }
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_id" : "ff8080815f9a3c84015f9a438ff70001"
}
```

Status code: 400

Example response for a failed request

```
{
  "error_code" : "GES.7000",
  "error_msg" : "The graph does not exist or has been deleted."
}
```

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Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.3.4 Deleting a Backup

Function

This API is used to delete a backup.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

DELETE /v2/{project_id}/graphs/{graph_id}/backups/{backup_id}

Table 3-116 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
backup_id	Yes	String	Graph backup ID
graph_id	Yes	String	Graph ID

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Request Parameters

Table 3-117 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

None

Status code: 400

Table 3-118 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Delete a backup.

```
DELETE https://Endpoint/v2/{project_id}/graphs/{graph_id}/backups/{backupId}
```

Example Response

Status code: 200

Example response for a successful request

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```
{ }
```

Status code: 400

Example response for a failed request

```
{
  "error_msg" : "Parameter error!",
  "error_code" : "GES.0001"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.4 Metadata Management

3.4.1 Constraints

Table 3-119 and **Table 3-120** list the metadata types.

Table 3-119 Metadata property constraints

Data Type	Constraints
char	• Less than '<' • Greater than '>' • Equal to '=' • Not equal to '! =' • In range 'range' • Greater than or equal to '>=' • Less than or equal to '<='

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Data Type	Constraints
char array	• Less than '<' • Greater than '>' • Equal to '=' • Not equal to '! =' • In range 'range' • Greater than or equal to '>=' • Less than or equal to '<='
float	• Less than '<' • Greater than '>' • Equal to '=' • Not equal to '! =' • In range 'range' • Greater than or equal to '>=' • Less than or equal to '<='
double	• Less than '<' • Greater than '>' • Equal to '=' • Not equal to '! =' • In range 'range' • Greater than or equal to '>=' • Less than or equal to '<='
bool	• Equal to '=' • Not equal to '! ='
long	• Less than '<' • Greater than '>' • Equal to '=' • Not equal to '! =' • In range 'range' • Greater than or equal to '>=' • Less than or equal to '<='
int	• Less than '<' • Greater than '>' • Equal to '=' • Not equal to '! =' • In range 'range' • Greater than or equal to '>=' • Less than or equal to '<='

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Data Type	Constraints
date	• Less than '<' • Greater than '>' • Equal to '=' • Not equal to '! =' • In range 'range' • Greater than or equal to '>=' • Less than or equal to '<='
enum	• Equal to '=' • Not equal to '! ='
string	• Less than '<' • Greater than '>' • Equal to '=' • Not equal to '! =' • In range 'range' • Greater than or equal to '>=' • Less than or equal to '<='

Table 3-120 Property-level constraints

Property Level	Constraints	Description
Single value/ Multiple values	has	This property is contained.
Single value/ Multiple values	hasNot	This property is not contained.

3.4.2 Querying the Metadata List

Function

Query the metadata list.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

GET /v2/{project_id}/graphs/metadatas

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Table 3-121 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

Table 3-122 Query parameters

Parameter	Mandatory	Type	Description
limit	No	Integer	Maximum number of resources displayed on a single page. The default value is **10**.
offset	No	Integer	Start position of the request. The default value is **0**.

Request Parameters

Table 3-123 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

Table 3-124 Response body parameters

Parameter	Type	Description
schema_count	Integer	Number of returned metadata files. This parameter is left blank when the request fails.
schema_list	Array of **schema_list** objects	List of all metadata files under the current project ID. This parameter is left blank when the request fails.

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Table 3-125 schema_list

Parameter	Type	Description
id	String	Metadata ID
name	String	Metadata name
start_time	String	Metadata creation time
last_update_time	String	Last update time of the metadata
encrypted	Boolean	Whether metadata is encrypted
description	String	Metadata description
metadata_path	String	Metadata path
status	String	Whether the metadata is available

Status code: 500

Table 3-126 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Query the metadata list.

```
GET https://Endpoint/v2/{project_id}/graphs/metadatas?offset=0&limit=2
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "schema_count" : 2,
```

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```
 "schema_list" : [ {
   "start_time" : "2022-01-21T10:13:31",
   "last_update_time" : "2022-01-21T10:13:31",
   "encrypted" : true,
   "name" : "schema_748e",
   "master_key_id" : "106be30a-733d-45d0-84f3-1c5439381313",
   "description" : "xxxxx",
   "id" : "6634c50e-13aa-4395-8088-6b327f7da694",
   "metadata_path" : "devdata/schema_748e.xml",
   "status" : "200"
 }, {
   "start_time" : "2022-04-12T03:15:17",
   "last_update_time" : "2022-11-16T08:18:32",
   "encrypted" : false,
   "name" : "unionsdk_schema",
   "id" : "6b74069d-3cf3-4cc0-9118-2478e23b87aa",
   "metadata_path" : "devdata/unionsdk/unionsdk_schema.xml",
   "status" : "200"
 } ]
}
```


Status code: 500

Example response for a failed request


```
{
  "error_code" : "GES.7006",
  "error_msg" : "The underlying graph engine has internal error."
}
```


Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.4.3 Querying Metadata

Function

This API is used to query the metadata of a graph.

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Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

GET /v2/{project_id}/graphs/metadatas/{metadata_id}

Table 3-127 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
metadata_id	Yes	String	Metadata ID

Request Parameters

Table 3-128 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

Table 3-129 Response body parameters

Parameter	Type	Description
encrypted	Boolean	Whether metadata is encrypted
ges_metadata	**ges_metadata** object	Object for storing metadata message information.

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Table 3-130 ges_metadata

Parameter	Type	Description
labels	Array of **labels** objects	Label data structure set

Table 3-131 labels

Parameter	Type	Description
name	String	Label name
properties	Array of Map<String,String> objects	Property map

Status code: 400

Table 3-132 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Query metadata of a graph.

```
GET https://Endpoint/v2/{project_id}/graphs/metadatas/{metadata_id}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "encrypted" : false,
  "ges_metadata" : {
```

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```
  "labels" : [ {
    "name" : "friends"
  }, {
    "name" : "movie",
    "properties" : [ {
      "data_type" : "string",
      "name" : "ChineseTitle",
      "cardinality" : "single"
    }, {
      "data_type" : "int",
      "name" : "Year",
      "cardinality" : "single"
    }, {
      "data_type" : "string",
      "name" : "Genres",
      "cardinality" : "set"
    } ]
  }, {
    "name" : "user",
    "properties" : [ {
      "data_type" : "string",
      "name" : "ChineseName",
      "cardinality" : "single"
    }, {
      "type_name1" : "F",
      "type_name2" : "M",
      "data_type" : "enum",
      "name" : "Gender",
      "type_name_count" : "2",
      "cardinality" : "single"
    }, {
      "type_name1" : "Under 18",
      "type_name2" : "18-24",
      "type_name3" : "25-34",
      "type_name4" : "35-44",
      "type_name5" : "45-49",
      "type_name6" : "50-55",
      "type_name7" : "56+",
      "data_type" : "enum",
      "name" : "Age",
      "type_name_count" : "7",
      "cardinality" : "single"
    }, {
      "data_type" : "string",
      "name" : "Occupation",
      "cardinality" : "single"
    }, {
      "data_type" : "char array",
      "name" : "Zip-code",
      "max_data_size" : "12",
      "cardinality" : "single"
    } ]
  }, {
    "name" : "rate",
    "properties" : [ {
      "data_type" : "int",
      "name" : "Score",
      "cardinality" : "single"
    }, {
      "data_type" : "date",
      "name" : "Datetime",
      "cardinality" : "single"
    } ]
  } ]
 }
}
```


Status code: 400

Example response for a failed request

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```
{
  "error_msg" : "6b74069d-3cf3-4cc0-9118-2478e23b87a does not exist.",
  "error_code" : "GES.2067"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.4.4 Adding Metadata

Function

This API is used to add metadata.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/metadatas

Table 3-133 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

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Request Parameters

Table 3-134 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. The token can be obtained by calling the IAM API. (The token is the value of **X-Subject-Token** in the response header.)

Table 3-135 Request body parameters

Parameter	Mandatory	Type	Description
metadata_path	Yes	String	Path for storing metadata
name	Yes	String	Metadata name, which contains 1 to 64 characters consisting of only letters, digits, and underscores (_)
description	Yes	String	Metadata description
is_overwrite	Yes	Boolean	Whether to overwrite the file.
ges_metadata	Yes	**ges_metadata** object	Object for storing metadata message information.

Table 3-136 ges_metadata

Parameter	Mandatory	Type	Description
labels	Yes	Array of **labels** objects	Label list

Table 3-137 labels

Parameter	Mandatory	Type	Description
name	No	String	Name of a label
properties	No	Array of Map<String,String> objects	Label property map

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Response Parameters

Status code: 200

Table 3-138 Response body parameters

Parameter	Type	Description
id	String	Metadata ID
name	String	Metadata name

Status code: 400

Table 3-139 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Add metadata. The metadata is stored in **devdata/unionsdk/unionsdk_test.xml**. The metadata does not overwrite existing data, the metadata name is **unionsdk_test**, and the metadata description is **test**.

```
POST https://Endpoint/v2/{project_id}/graphs/metadatas

{
  "metadata_path" : "devdata/unionsdk/unionsdk_test.xml",
  "is_overwrite" : false,
  "name" : "unionsdk_test",
  "description": " test",
  "ges_metadata" : {
    "labels" : [ {
      "name" : "friends"
    }, {
      "name" : "movie",
      "properties" : [ {
        "dataType" : "string",
        "name" : "ChineseTitle",
        "cardinality" : "single"
      }, {
        "dataType" : "int",
```

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```
      "name" : "Year",
      "cardinality" : "single"
    }, {
      "dataType" : "string",
      "name" : "Genres",
      "cardinality" : "set"
    } ]
  }, {
    "name" : "user",
    "properties" : [ {
      "dataType" : "string",
      "name" : "ChineseName",
      "cardinality" : "single"
    }, {
      "typeName1" : "F",
      "typeName2" : "M",
      "typeNameCount" : "2",
      "dataType" : "enum",
      "name" : "Gender",
      "cardinality" : "single"
    }, {
      "typeName1" : "Under 18",
      "typeName2" : "18-24",
      "typeName3" : "25-34",
      "typeName4" : "35-44",
      "typeNameCount" : "7",
      "dataType" : "enum",
      "name" : "Age",
      "typeName5" : "45-49",
      "typeName6" : "50-55",
      "cardinality" : "single",
      "typeName7" : "56+"
    }, {
      "dataType" : "string",
      "name" : "Occupation",
      "cardinality" : "single"
    }, {
      "dataType" : "char array",
      "name" : "Zip-code",
      "maxDataSize" : "12",
      "cardinality" : "single"
    } ]
  }, {
    "name" : "rate",
    "properties" : [ {
      "dataType" : "int",
      "name" : "Score",
      "cardinality" : "single"
    }, {
      "dataType" : "date",
      "name" : "Datetime",
      "cardinality" : "single"
    } ]
  } ]
 }
}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "id" : "ff8080815f9a3c84015f9a438ff70001",
  "name" : "movie_schema"
}
```

Status code: 400

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Example response for a failed request

```
{
  "error_msg" : "The metadata file already exists.",
  "error_code" : "GES.2067"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.4.5 Deleting Metadata

Function

This API is used to delete metadata.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

DELETE /v2/{project_id}/graphs/metadatas/{metadata_id}

Table 3-140 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
metadata_id	Yes	String	Metadata ID

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Request Parameters

Table 3-141 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 400

None

Status code: 200

Table 3-142 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Delete metadata.

```
DELETE /v2/{project_id}/graphs/metadatas/{metadata_id}
```

Example Response

Status code: 200

OK

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```
{ }
```

Status code: 400

Bad Request

```
{
  "error_code" : "GES.7024",
  "error_msg" : "The metadata is not exist or has been deleted."
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.4.6 Importing Metadata from OBS

Function

This API is used to import metadata from OBS.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/metadata/upload-from-obs

Table 3-143 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

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Request Parameters

Table 3-144 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. The token can be obtained by calling the IAM API. (The token is the value of **X-Subject-Token** in the response header.)

Table 3-145 Request body parameters

Parameter	Mandatory	Type	Description
metadata_path	Yes	String	Path for storing metadata
name	Yes	String	Metadata name
description	No	String	Metadata description
encryption	No	**encryption** object	Whether metadata is encrypted

Table 3-146 encryption

Parameter	Mandatory	Type	Description
enable	No	Boolean	Whether to enable data encryption

Response Parameters

Status code: 200

Table 3-147 Response body parameters

Parameter	Type	Description
id	String	Metadata ID
name	String	Metadata name

Status code: 400

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Table 3-148 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Import metadata from OBS. The metadata is stored in **devdata/unionsdk/schema.xml** and the metadata name is **test_schema**.

```
POST https://Endpoint/v2/{project_id}/graphs/metadata/upload-from-obs

{
  "metadata_path" : "devdata/unionsdk/schema.xml",
  "name" : "test_schema",
  "description" : "xx"
}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "id" : "d30d2e94-f2ee-4344-af49-eb27fd002eea",
  "name" : "test_schema"
}
```

Status code: 400

Example response for a failed request

```
{
  "error_msg" : "test_schema The name already exists.",
  "error_code" : "GES.2067"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.

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Return Value	Description
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.5 Task Center

3.5.1 Querying Job Status on the Management Plane

Function

This interface is used to query the execution status of a task, such as ECS creation, ECS deletion, ECS batch operation, and NIC operation. Asynchronous APIs that are used to create, stop, start, delete, and import graphs will return job IDs after commands are sent. You can query the job execution status according to the job IDs.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

GET /v2/{project_id}/graphs/{graph_id}/jobs/{job_id}/status

Table 3-149 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID
job_id	Yes	String	ID of an asynchronous job

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Request Parameters

Table 3-150 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

Table 3-151 Response body parameters

Parameter	Type	Description
job_id	String	Job ID
status	String	The task status. • **pending** • **running** • **success** • **failed**
job_type	String	Job type.
job_name	String	Task name
related_graph	String	Associated graph name
begin_time	String	Job start time (UTC). The format is yyyy-MM-dd'T'HH:mm:ss.
end_time	String	Job end time (UTC). The format is yyyy-MM-dd'T'HH:mm:ss.
job_detail	**job_detail** object	This parameter is returned only when **jobName** is set to **ImportGraph** and is used to display graph import details.
fail_reason	String	Job failure cause
job_progress	Double	Job execution progress. It is a reserved field, and not used currently.

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Table 3-152 job_detail

Parameter	Type	Description
schema_path	Array of **schema_path** objects	Path for storing metadata
edgeset_path	Array of **edgeset_path** objects	Path for storing the edge data set
vertexset_path	Array of **vertexset_path** objects	Path for storing the vertex data set

Table 3-153 schema_path

Parameter	Type	Description
path	String	OBS storage path
log	String	Import log
status	String	OBS file status. Options: • **success**: Imported successfully. • **Failed**: Failed to import the file. • **partFailed**: Partially failed.
cause	String	Import failure cause
total_lines	Long	Total number of imported lines. The value **-1** indicates that this field is not returned in the current version.
failed_lines	Long	Lines failed to be imported. The value **-1** indicates that this field is not returned in the current version.
successful_lines	Long	Number of lines that are successfully imported. The value **-1** indicates that this field is not returned in the current version.

Table 3-154 edgeset_path

Parameter	Type	Description
path	String	OBS storage path
log	String	Import log

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Parameter	Type	Description
status	String	OBS file status. Options: • **success**: Imported successfully. • **Failed**: Failed to import the file. • **partFailed**: Partially failed.
cause	String	Import failure cause
total_lines	Long	Total number of imported lines. The value **-1** indicates that this field is not returned in the current version.
failed_lines	Long	Lines failed to be imported. The value **-1** indicates that this field is not returned in the current version.
successful_lines	Long	Number of lines that are successfully imported. The value **-1** indicates that this field is not returned in the current version.

Table 3-155 vertexset_path

Parameter	Type	Description
path	String	OBS storage path
log	String	Import log
status	String	OBS file status. Options: • **success**: Imported successfully. • **Failed**: Failed to import the file. • **partFailed**: Partially failed.
cause	String	Import failure cause
total_lines	Long	Total number of imported lines. The value **-1** indicates that this field is not returned in the current version.
failed_lines	Long	Lines failed to be imported. The value **-1** indicates that this field is not returned in the current version.
successful_lines	Long	Number of lines that are successfully imported. The value **-1** indicates that this field is not returned in the current version.

Status code: 400

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Table 3-156 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Query the execution status of a job.

```
GET https://Endpoint/v2/{project_id}/graphs/{graph_id}/jobs/{job_id}/status
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_id" : "ff80808167f09aaa0167f19b35ec0305",
  "status" : "success",
  "job_type" : "GraphManagement",
  "job_name" : "ImportGraph",
  "related_graph" : "GES_UI_AUTO",
  "begin_time" : "2018-11-27T21:39:00",
  "end_time" : "2018-11-27T21:39:56",
  "job_detail" : {
    "vertexset_path" : [ {
      "path" : "ges-ui/auDatas/list_set_vertex.csv",
      "log" : null,
      "cause" : null,
      "status" : "success"
    } ],
    "edgeset_path" : [ {
      "path" : "ges-ui/auDatas/list_set_edge.csv",
      "log" : null,
      "cause" : null,
      "status" : "success"
    } ],
    "schema_path" : [ {
      "path" : "ges-ui/auDatas/list_set_schema.xml",
      "log" : null,
      "cause" : null,
      "status" : "success"
    } ]
  },
  "job_progress" : 0
}
```

Status code: 400

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Example response for a failed request

```
{
  "error_msg" : "can not find job, jobId is ff808081646e81d40164c5fb414b2b1a1",
  "error_code" : "GES.8301"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.5.2 Querying Job Details in the Job Center

Function

This API is used to query asynchronous job details in the job center on the management plane. Asynchronous jobs include creating, closing, starting, deleting, adding, importing, exporting, and upgrading graphs, as well as adding backups.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

GET /v2/{project_id}/graphs/jobs

Table 3-157 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID, which is used for resource isolation.

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Table 3-158 Query parameters

Parameter	Mandatory	Type	Description
end_time	No	String	Job end date. Currently, only the date is supported. The format is *yyyy-MM-dd*, for example, 2019-03-27.
graph_name	No	String	Associated graph name
limit	No	String	Maximum number of resources displayed on a single page. The default value is **10**.
offset	No	String	Start position of the request. The default value is **0**.
start_time	No	String	Job start date. Currently, only the date is supported. The format is *yyyy-MM-dd*, for example, 2019-03-27.
status	No	String	The task status. Options: • running • waiting • success • failed

Request Parameters

Table 3-159 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

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Table 3-160 Response body parameters

Parameter	Type	Description
job_count	Integer	Total number of jobs
job_list	Array of **job_list** objects	Task list

Table 3-161 job_list

Parameter	Type	Description
job_id	String	Job ID
status	String	The task status. • **pending** • **running** • **success** • **failed**
job_type	String	Job type.
job_name	String	Task name
related_graph	String	Associated graph name
begin_time	String	Job start time (UTC). The format is yyyy-MM-dd'T'HH:mm:ss.
end_time	String	Job end time (UTC). The format is yyyy-MM-dd'T'HH:mm:ss.
job_detail	**job_detail** object	This parameter is returned only when **jobName** is set to **ImportGraph** and is used to display graph import details.
fail_reason	String	Job failure cause
job_progress	Double	Job execution progress. It is a reserved field, and not used currently.

Table 3-162 job_detail

Parameter	Type	Description
schema_path	Array of **schema_path** objects	Path for storing metadata

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Parameter	Type	Description
edgeset_path	Array of **edgeset_path** objects	Path for storing the edge data set
vertexset_path	Array of **vertexset_path** objects	Path for storing the vertex data set

Table 3-163 schema_path

Parameter	Type	Description
path	String	OBS storage path
log	String	Import log
status	String	OBS file status. Options: • **success**: Imported successfully. • **Failed**: Failed to import the file. • **partFailed**: Partially failed.
cause	String	Import failure cause
total_lines	Long	Total number of imported lines. The value **-1** indicates that this field is not returned in the current version.
failed_lines	Long	Lines failed to be imported. The value **-1** indicates that this field is not returned in the current version.
successful_lines	Long	Number of lines that are successfully imported. The value **-1** indicates that this field is not returned in the current version.

Table 3-164 edgeset_path

Parameter	Type	Description
path	String	OBS storage path
log	String	Import log
status	String	OBS file status. Options: • **success**: Imported successfully. • **Failed**: Failed to import the file. • **partFailed**: Partially failed.

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Parameter	Type	Description
cause	String	Import failure cause
total_lines	Long	Total number of imported lines. The value **-1** indicates that this field is not returned in the current version.
failed_lines	Long	Lines failed to be imported. The value **-1** indicates that this field is not returned in the current version.
successful_lines	Long	Number of lines that are successfully imported. The value **-1** indicates that this field is not returned in the current version.

Table 3-165 vertexset_path

Parameter	Type	Description
path	String	OBS storage path
log	String	Import log
status	String	OBS file status. Options: • **success**: Imported successfully. • **Failed**: Failed to import the file. • **partFailed**: Partially failed.
cause	String	Import failure cause
total_lines	Long	Total number of imported lines. The value **-1** indicates that this field is not returned in the current version.
failed_lines	Long	Lines failed to be imported. The value **-1** indicates that this field is not returned in the current version.
successful_lines	Long	Number of lines that are successfully imported. The value **-1** indicates that this field is not returned in the current version.

Status code: 400

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Table 3-166 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Query asynchronous job details in the job center on the management plane.

```
GET https://Endpoint/v2/{project_id}/graphs/jobs?offset=0&limit=100
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "job_count" : 2,
  "job_list" : [ {
    "job_id" : "ff80808167bb90340167bc3c7b5b026a",
    "status" : "success",
    "job_type" : "GraphManagement",
    "job_name" : "ImportGraph",
    "related_graph" : "test1217",
    "begin_time" : "2018-12-17T12:55:40",
    "end_time" : "2018-12-17T12:56:32",
    "job_detail" : {
      "vertexset_path" : null,
      "edgeset_path" : [ {
        "path" : "hkmovie/edge.csv",
        "log" : null,
        "cause" : null,
        "status" : "success"
      } ],
      "schema_path" : [ {
        "path" : "hkmovie/schema.xml",
        "log" : null,
        "cause" : null,
        "status" : "success"
      } ]
    },
    "job_progress" : 0
  }, {
    "job_id" : "ff80808167bb90340167bc5d0b1d0358",
    "status" : "success",
    "job_type" : "GraphManagement",
    "job_name" : "DeleteGraph",
    "related_graph" : "test1218",
```

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```
    "begin_time" : "2018-12-17T13:31:14",
    "end_time" : "2018-12-17T13:34:48",
    "job_progress" : 0
  } ]
}
```

Status code: 400

Example response for a failed request

```
{
  "error_msg" : "failed",
  "error_code" : "GES.9999"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.6 Plugin Management

3.6.1 Querying Scene Analysis Plugin Information

Function

This API is used to query the information about the application analysis capability in a scene, including information about the applications, parameters, and function details.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

GET /v2/{project_id}/graphs/scenes

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Table 3-167 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

Table 3-168 Query parameters

Parameter	Mandatory	Type	Description
scene_name	No	String	Scene name. If only **scene_name** is specified, all application details in the specified scene will be returned. If only **scene_name** and **application_name** are specified, details about the applications requested by **application_name** will be returned. If **scene_name**, **application_name**, and **graph_id** are left empty, details of all scene applications will be returned.
application_name	No	String	Application name. If only **scene_name** and **application_name** are specified, details about the applications requested by **application_name** will be returned. If **scene_name**, **application_name**, and **graph_id** are left empty, details of all scene applications will be returned.
graph_id	No	String	Graph ID. If only **graph_id** is set, details about all the subscribed applications of the graph ID will be returned. If **scene_name**, **application_name**, and **graph_id** are left empty, details of all scene applications will be returned.

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Request Parameters

Table 3-169 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Response Parameters

Status code: 200

Table 3-170 Response body parameters

Parameter	Type	Description
results	Array of **results** objects	Scene analysis plugin information

Table 3-171 results

Parameter	Type	Description
scene	String	Scene name
name	String	Application name
params	Array of **params** objects	Parameter list
description	String	Description of an application in a scene

Table 3-172 params

Parameter	Type	Description
name	String	Parameter name

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Parameter	Type	Description
type	String	Parameter type. The value range is ["string","int"]. Currently, only **"string"** is supported.
default_value	String	The value can be left empty or a specified value. If you left the value empty, the parameter is not nullable.

Status code: 400

Table 3-173 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Query the information about the application analysis capability in a scene.

```
GET /v2/{project_id}/graphs/scenes?scene_name=xxx&application_name=xxx&graph_id=xxx
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "results" : [ {
    "name" : "movie_recommendation",
    "description": "Recommend movies that friends are interested in. Graph constraints: (user)-[friends]->(user), (user)-[rates]->(movie)",
    "params" : [ {
      "name" : "user",
      "default_value" : "",
      "type" : "string"
    } ],
    "scene" : "MovieSocialNetwork_V2"
  }, {
    "name" : "friend_recommendation",
```

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```
    "description": "Recommend people who you may be interested in (considering the relationships between potential friends and movie preference). Graph constraints: (user) -[friends]-> (user), (user) -[rates]-> (movie)",
    "params" : [ {
      "name" : "user",
      "default_value" : "",
      "type" : "string"
    } ],
    "scene" : "MovieSocialNetwork_V2"
  } ]
}
```

Status code: 400

Example response for a failed request

```
{
  "error_msg" : "The request body or header is invalid.",
  "error_code" : "GES.7016"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.6.2 Subscribing to a Scene Analysis Plugin

Function

This API is used to subscribe to a scene analysis plugin so that you can use the function through the service plane APIs.

NOTE

A subscribed plugin cannot be subscribed repeatedly. To update the plugin, cancel the subscription and subscribe to it again after update.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

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URI

POST /v2/{project_id}/graphs/{graph_id}/scenes/register

Table 3-174 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_id	Yes	String	Graph ID

Request Parameters

Table 3-175 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Table 3-176 Request body parameters

Parameter	Mandatory	Type	Description
scenes	No	Array of **scenes** objects	Scene you want to subscribe to

Table 3-177 scenes

Parameter	Mandatory	Type	Description
name	No	String	Scene name
applications	No	Array of strings	List of applications you want to subscribe to (not supported currently).

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Response Parameters

Status code: 200

Table 3-178 Response body parameters

Parameter	Type	Description
result	String	Subscription result

Status code: 400

Table 3-179 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Subscribe to an application scenario analysis plugin. The scenario name is **Service ticket association analysis**, and the list of applications is **In-depth analysis of dynamic high-dimension relationships**.

```
POST /v2/{project_id}/graphs/{graph_id}/scenes/register

{
  "scenes" : [ {
    "name": "Service ticket association analysis",
    "applications": ["In-depth analysis of dynamic high-dimension relationships"]
  } ]
}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "result" : "success"
}
```

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Status code: 400

Example response for a failed request

```
{
  "error_msg" : "graph [demo] is not found",
  "error_code" : "GES.8402"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

3.6.3 Unsubscribing from a Scene Analysis Plugin

Function

This API is used to unsubscribe from a scene analysis plugin. After the subscription is canceled, you cannot use the function through application service plane APIs.

Debugging

You can debug this API in **API Explorer**, which supports automatic authentication. API Explorer automatically generates sample SDK code and provides the debugging function.

URI

POST /v2/{project_id}/graphs/{graph_id}/scenes/unregister

Table 3-180 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

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Parameter	Mandatory	Type	Description
graph_id	Yes	String	Graph ID

Request Parameters

Table 3-181 Request header parameter

Parameter	Mandatory	Type	Description
X-Auth-Token	Yes	String	User token. It is used to obtain the permission to call APIs. For details about how to obtain the token, see **Authentication**. The value of X-Subject-Token in the response header is the token.

Table 3-182 Request body parameters

Parameter	Mandatory	Type	Description
scenes	No	Array of **scenes** objects	List of scenes you want to unsubscribe from

Table 3-183 scenes

Parameter	Mandatory	Type	Description
name	No	String	Scene name
applications	No	Array of strings	List of applications you want to unsubscribe from

Response Parameters

Status code: 200

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Table 3-184 Response body parameters

Parameter	Type	Description
success	Array of strings	Scene application that is successfully unsubscribed from
failure	Array of strings	Scene application that fails to be unsubscribed from

Status code: 400

Table 3-185 Response body parameters

Parameter	Type	Description
error_code	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error code.
error_msg	String	System prompt. • If the execution succeeds, this parameter may be left blank. • If the execution fails, this parameter is used to display the error message.

Example Request

Unsubscribe from a scenario analysis plugin. The scenario name is **Service ticket association analysis**, and the list of applications is **In-depth analysis of dynamic high-dimension relationships**.

```
POST /v2/{project_id}/graphs/{graph_id}/scenes/unregister

{
  "scenes" : [ {
    "name": "Service ticket association analysis",
    "applications": ["In-depth analysis of dynamic high-dimension relationships"]
  } ]
}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "success" : [ "testCase" ],
  "failure" : [ "xxx" ]
}
```

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Status code: 400

Example response for a failed request

```
{
  "error_msg" : "graph [demo] is not found",
  "error_code" : "GES.8402"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

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4 Service Plane APIs

4.1 Memory Edition

4.1.1 Vertex Operation APIs

4.1.1.1 Querying Vertices That Meet Filter Criteria

Function

This API is used to query vertices that meet filter criteria.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=query

Table 4-1 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Request Parameters

Table 4-2 Request body parameters

Parameter	Mandatory	Type	Description
labels	Either **labels** or **vertexFilters** is mandatory.	String	Filter criteria of the vertex type
vertexFilters	Either **labels** or **vertexFilters** is mandatory.	Object	Filter criteria, in JSONArray format. Vertices are filtered by property.
offset	No	Integer	Start position of the request
limit	No	Integer	Maximum number of resources displayed on a single page. The default value is **10**.
sorts	No	Object	Result sorting property, in JSONArray format

Table 4-3 sorts parameter description

Parameter	Mandatory	Type	Description
key	Either **Key** or **propertyName** is mandatory.	String	Possible values are **id**, **label**, and **property**. These values indicate that IDs, labels, or properties are sorted.
propertyName	Either **Key** or **propertyName** is mandatory.	String	Property name
orderValue	No	String	Possible values are **incr** and **decr**, which indicate ascending and descending order respectively. The default value is **incr**.

Table 4-4 vertexFilters parameter structure

Parameter	Mandatory	Type	Description
propertyName	Yes	String	Property name

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Parameter	Mandatory	Type	Description
predicate	Yes	String	Predicate. Available values are **=**, **<**, **>**, **<=**, **>=**, **range**, **has**, **hasNot**. **NOTE** If the property is of the composite type, such as list or set, the predicate can only be **has** or **hasNot**.
values	No	String	Property value.
type	No	String	Logical operator of the filter criteria. Possible values are **and** and **or**. The default value is **and**.

Response Parameters

Table 4-5 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of the vertex query job. This parameter is left blank when the request fails. **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Querying Job Status on the Service Plane**.
jobType	Integer	Job type. This parameter is left blank when the request fails.

Example Request

Query vertices that meet filter criteria. The start position of the request is **0**, the maximum number of resources on each page is **2**, the attribute criteria for filtering are **movie** and **user**, and the attribute name for filtering is **Age**.

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```
POST https://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=query

{
  "offset":0,
  "limit":2,
  "labels": ["movies",
          "user"],
  "vertexFilters":[{
    "propertyName":"Age",
    "predicate":"=",
    "values":["18-24"]
    }
  ]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example 1 for vertexFilters

```
[
 {
  "propertyName":"Gender",
  "predicate":"=",
  "values":["F"]
 },
 {
  "propertyName":"Age",
  "predicate":"range",
  "values":["18-24","56+"],
  "type":"or"
 }
]
```

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
    "jobId": "03e774f5-29ea-4187-9508-5435f3892ead016886200",
    "jobType": 1
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
    "errorMessage": "Bad Request, parameter labels and vertexFilters cannot all be null",
    "errorCode": "GES.8203"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.

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Return Value	Description
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.1.2 Querying Vertex Details

Function

This API is used to query the vertex information (such as the label and property) based on the vertex ID.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/detail?vertexIds={vertex_ids}

Table 4-6 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
vertex_ids	Yes	String	IDs of the vertices to be queried. When multiple IDs are specified by **vertexIds**, separate the IDs with commas (,) in the URL.

Request Parameters

Table 4-7 Request body parameter

Parameter	Type	Description
data	List	Vertex details you want to query. For details, see **data parameters**.

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Table 4-8 data parameter description

Parameter	Type	Description
vertices	List	Vertex result set. If no corresponding vertices are found, the value of **vertices** is empty.

Response Parameters

Table 4-9 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Query results.

Example Request

Query node information by node ID and return node details.

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/detail?vertexIds=Ray
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
   "data": {
      "vertices": [
         {
            "id": "Ray",
            "label": "user",
            "properties": {
               "Occupation": [
```

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```
                "college/grad student"
            ],
            "Name": [
              "Lei"
            ],
            "Zip-code": [
                "90241"
            ],
            "Gender": [
                "M"
            ],
            "Age": [
                "18-24"
            ]
        }
    }
  ]
 }
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
 {
  "errorMessage":"graph [demo] is not found",
  "errorCode":"GES.8204"
 }
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.1.3 Adding a Vertex

Function

This API is used to add a vertex.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices

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Table 4-10 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-11 Request body parameters

Parameter	Mandatory	Type	Description
vertex	Yes	String	Vertex name
label	Yes	String	Label of a vertex. If no label exists, set it to **__DEFAULT__**.
properties	No	Json	Value of each property

Response Parameters

Table 4-12 Parameter description

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

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Example Request

Add a vertex named **Lily** and set the vertex label to **user**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices
{
    "vertex":"Lily",
    "label":"user",
    "properties":{
        "Age":[
            "under 18"
        ],
        "Gender":[
            "F"
        ],
        "Occupation":[
            "artist"
        ],
        "Zip-code":[
            "98133"
        ]
    }
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
"errorMessage": "vertex [Lily] already exists",
"errorCode": "GES.8000"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

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Error Code

See **Error Code**.

4.1.1.4 Deleting a Vertex

Function

This API is used to delete a vertex.

URI

DELETE /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/{vertex_id}

Table 4-13 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
vertex_id	Yes	String	Vertex ID

Response Parameters

Table 4-14 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.

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Parameter	Type	Description
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Delete a vertex.

```
DELETE http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/Lily
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
 "result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage": "vertex [Lily] does not exist",
 "errorCode": "GES.8000"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

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4.1.1.5 Updating Vertex Properties

Function

This API is used to update vertex property values. The operations include ADD, UPDATE, and DEL.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/{vertex_id}/properties/action?action_id={actionId}

Table 4-15 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
vertex_id	Yes	String	Vertex ID
actionId	Yes	String	Operator. Possible values: • **UPDATE**: Update the value of a property. • **ADD**: Add the value to a property. When the property's **cardinality** is **single**, the operation is the same as that of **UPDATE**. When **cardinality** is **list** or **set**, the operator adds a value to a set. • **DEL**: Delete a property value.

Request Parameters

Table 4-16 Request body parameters

Parameter	Mandatory	Type	Description
properties	Yes	Object	Value of each property
label	No	String	Name of a label

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Response Parameters

Table 4-17 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Update the property value of a vertex. The value of the **Age** property is **under 18**, and the value of the **Gender** property is **F**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/Lily/properties/action?
action_id={actionId}
{
   "properties":{

      "Age":[
         "under 18"
      ],
      "Gender":[
         "F"
      ]
   }
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
 {
  "result": "success"
 }
```

Status code: 400

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Example response for a failed request

```
Http Status Code: 400
 {
  "errorMessage": "vertex [Lily] does not exist",
  "errorCode": "GES.8220"
 }
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.1.6 Querying Vertex Data in Batches

Function

This API is used to query the vertex data (such as the labels and properties) in batches based on the vertex IDs.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=batch-query

Table 4-18 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Request Parameters

Table 4-19 Request body parameters

Parameter	Mandatory	Type	Description
vertices	Yes	String	Vertex IDs you use to query the vertices

Response Parameters

Table 4-20 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	The **data** field is contained when the query is successful, and the **data** field contains the vertices query result.
result	String	Query results. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Query nodes in batches by node ID. The vertex IDs to be queried are **27003509_Station Building** and **39636392_Badaling Great Wall**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=batch-query
{
  "vertices":
 ["27003509_Station Building",
 "39636392_Badaling Great Wall"]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

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Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
   "data": {
      "vertices": [
         {
            "id": "27003509_Station Building",
            "label": "tag",
            "properties": {
               "popularity": [
                  0
               ],
               "name": [
                  "Station Building"
               ],
               "alias": [
                  "Guanghua Road Office",
                  "Headquarters",
                  "Giant Underpants",
                  "Headquarters Building"
               ]
            }
         },
         {
            "id": "39636392_Badaling Great Wall",
            "label": "tag",
            "properties": {
               "popularity": [
                  0
               ],
               "name": [
                 "Badaling Great Wall"
               ],
               "alias": [
                  "Great Wall"
               ]
            }
         }
      ]
   },
    "result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": " Bad Request, parameter vertices cannot be null",
  "errorCode": "GES.8214"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.

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Return Value	Description
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.1.7 Adding Vertices in Batches

Function

This API is used to add vertices in batches.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=batch-add

Table 4-21 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-22 Request body parameters

Parameter	Mandatory	Type	Description
vertices	Yes	Json	Vertices you want to add. A maximum of 10,000 vertices can be added at a time. For details about this array, see the **vertices parameters**.

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Parameter	Mandatory	Type	Description
overrideExists	No	Boolean	Whether to overwrite the existing vertices in the **vertices** parameter. The default value is **false**. • If this parameter is set to **false**, existing vertices are ignored. • If this parameter is set to **true**, the existing vertices in the **vertices** parameter are overwritten.

Table 4-23 vertices parameter description

Parameter	Mandatory	Type	Description
vertex	Yes	String	Vertex ID
label	Yes	String	Vertex label
properties	No	Json	Value of each property

Response Parameters

Table 4-24 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.

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Parameter	Type	Description
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Add vertices in batches. The names of the vertices to be added are **150** and **6**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=batch-add
{
   "vertices": [
      {
         "vertex": "150",
         "label": "movie",
         "properties": {
            "movieid": [
               "150"
            ],
            "title": [
               "testmoive"
            ],
            "genres": [
               "Comedy"
            ]
         }
      },
      {
         "vertex": "6",
         "label": "movie",
         "properties": {
            "movieid": [
               "6"
            ],
            "title": [
               "testmoive_exist_id"
            ],
            "genres": [
               "Comedy"
            ]
         }
      }
   ],
   "overrideExists": true
}
```

NOTE

- **SERVER_URL**: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.
- In the example, if vertex **6** already exists in the graph, properties of vertex **6** are overwritten.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
```

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```
"result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
"errorMessage": "vertex [Lily] already exists",
"errorCode": "GES.8000"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.1.8 Deleting Vertices in Batches

Function

This API is used to delete vertices in batches based on the vertex IDs.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=batch-delete

Table 4-25 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Request Parameters

Table 4-26 Request body parameters

Parameter	Mandatory	Type	Description
vertices	Yes	String	Vertex ID array to be deleted

Response Parameters

Table 4-27 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Delete nodes in batches by node ID. The vertex IDs to be deleted are **Vivian** and **46**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=batch-delete
{
   "vertices": [
      "Vivian",
      "46"
   ]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

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Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
    "result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": " Bad Request, parameter vertices cannot be null",
  "errorCode": "GES.8214"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.1.9 Updating Vertex Properties in Batches

Function

This API is used to update vertex properties in batches.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/properties/action?action_id={actionId}

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Table 4-28 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
actionId	Yes	String	Operator. Possible values: • **batch-update**: Update the value of a property. • **batch-add**: Add the value to a property. When the property's **cardinality** is **single**, the operation is the same as that of **batch-update**. When **cardinality** is **list** or **set**, the operator adds a value to a set. • **batch-del**: Delete a property value.

Request Parameters

Table 4-29 Request body parameters

Parameter	Mandatory	Type	Description
vertices	Yes	Json	Vertex array to be updated For details about this array, see the **vertices parameters**.
ignoreError	No	Boolean	Whether to ignore the update error of specific vertices. The default value is **false**. • The value **false** indicates that if an error that causes the update failure is detected, for example, the vertex to be updated does not exist, an error is reported and no vertex will be updated. • The value **true** indicates that similar errors will be ignored and other vertex properties without errors will be updated.

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Table 4-30 vertices parameter description

Parameter	Mandatory	Type	Description
vertex	Yes	String	Vertex ID
label	No	String	Vertex label
properties	Yes	Json	Value of each property to be updated

Response Parameters

Table 4-31 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Update vertex properties in batches. The vertex names to be updated are **150** and **6**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/properties/action?
action_id=batch-update
{
    "vertices": [
        {
            "vertex": "150",
            "label": "movie",
            "properties": {
                "movieid": [
                    "150"
                ],
                "title": [
```

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```
                "testmoive"
            ],
            "genres": [
                "Comedy"
            ]
        }
    },
    {
        "vertex": "6",
        "properties": {
            "title": [
                "testmoive_exist_id"
            ],
            "genres": [
                "Comedy"
            ]
        }
    }
  ],
    "ignoreError": true

}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage":"vertex [Lily] does not exist",
 "errorCode":"GES.8220"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

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Error Code

See **Error Code**.

4.1.1.10 Adding a Vertex Label

Function

This API is used to add a vertex label.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/{vertex_id}/labels

Table 4-32 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
vertex_id	Yes	String	Vertex ID

Request Parameters

Table 4-33 Request body parameter

Parameter	Mandatory	Type	Description
label	Yes	String	Vertex label

Response Parameters

Table 4-34 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.

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Parameter	Type	Description
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.

Example Request

Add a vertex label named **user**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/{vertex_id}/labels
{
    "label":"user"
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage": "Same label [user] already exists",
 "errorCode": "GES.8213"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

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Error Code

See **Error Code**.

4.1.1.11 Deleting a Vertex Label

Function

This API is used to delete a vertex label.

URI

DELETE /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/{vertex_id}/labels/{label_name}

Table 4-35 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
vertex_id	Yes	String	Vertex ID
label_name	Yes	String	Vertex label

Response Parameters

Table 4-36 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.

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Parameter	Type	Description
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Delete a vertex label.

```
DELETE http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/46/labels/movie
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
 {
  "errorMessage": "Vertex [46] does not have label [movie]",
  "errorCode": "GES.8182"
 }
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

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4.1.1.12 Exporting Filtered Vertices

Function

This API is used to export the vertex set that meets the filter criteria.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=export

Table 4-37 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Example Request

Export vertices that meet filter criteria (only the asynchronous mode is supported). The export path is **demo_movie/**, and the export file name is **export_movie_and_user.csv**.

```
POST https://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=export
 {
   "labels": [
      "movies",
      "user"
   ],
   "vertexFilters": [
      {
         "propertyName": "Age",
         "predicate": "=",
         "values": [
            "18-24"
         ]
      }
   ],
   "exportPath": "demo_movie/",
   "fileName": "export_movie_and_user.csv",
   "obsParameters": {
      "accessKey": "XXXX",
      "secretKey": "XXXX"
   }
 }
```

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Request Parameters

Table 4-38 Request body parameters

Parameter	Mandatory	Type	Description
labels	Either **labels** or **vertexFilters** is mandatory.	String	Filter criteria of the vertex type
vertexFilters	Either **labels** or **vertexFilters** is mandatory.	Json	Filter criteria, in JSONArray format. Vertices are filtered by property. For details, see **vertexFilters parameters**.
exportPath	Yes	String	Export path
fileName	No	String	Name of the exported file
obsParameters	Yes	String	OBS authentication parameters. For details, see **obsParameters**.

Table 4-39 vertexFilters parameters

Parameter	Mandatory	Type	Description
propertyName	Yes	String	Property name
predicate	Yes	String	Predicate. Available values are =, <, >, <=, >=, **range**, **has**, **hasNot**.
values	No	String	Property value.
type	No	String	Logical operator of the filter criteria. Possible values are **and** and **or**. The default value is **and**.

Table 4-40 obsParameters parameter description

Parameter	Mandatory	Type	Description
accessKey	Yes	string	AK
secretKey	Yes	string	SK

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Response Parameters

Table 4-41 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of the edge query job **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
  "jobId": "03e774f5-29ea-4187-9508-5435f3892ead016886200",
  "jobType": 1
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "Bad Request, parameter labels and vertexFilters cannot all be null",
  "errorCode": "GES.8203"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.

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Return Value	Description
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.1.13 Deleting Filtered Vertices

Function

This API is used to delete the vertex set that meets the filter criteria.

Table 4-42 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=delete

Request Parameters

Table 4-43 Request body parameters

Parameter	Mandatory	Type	Description
labels	Either **labels** or **vertexFilters** is mandatory.	String	Filter criteria of the vertex type
vertexFilters	Either **labels** or **vertexFilters** is mandatory.	Object	Filter criteria, in JSONArray format. Vertices are filtered by property. For details, see **vertexFilters parameters**.

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Table 4-44 vertexFilters parameters

Parameter	Mandatory	Type	Description
propertyName	Yes	String	Property name
predicate	Yes	String	Predicate. Available values are =, <, >, <=, >=, **range**, **has**, **hasNot**.
values	No	String	Property value.
type	No	String	Logical operator of the filter criteria. Possible values are **and** and **or**. The default value is **and**.

Response Parameters

Table 4-45 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of the vertex query job. This parameter is left blank when the request fails. **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Querying Job Status on the Service Plane**.

Example Request

Delete vertices that meet filter criteria (only the asynchronous mode is supported). The vertex type filter criteria are **movies** and **user**, and the property name is **Age**.

```
POST https://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=delete
 {
   "labels": [
      "movies",
      "user"
   ],
   "vertexFilters": [
      {
         "propertyName": "Age",
```

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```
        "predicate": "=",
        "values": [
          "18-24"
        ]
      }
    ]
}
```

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
    "jobId": "03e774f5-29ea-4187-9508-5435f3892ead016886200",
    "jobType": 1
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
    "errorMessage": "Bad Request, parameter labels and vertexFilters cannot all be null",
    "errorCode": "GES.8203"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.2 Edge Operation APIs

4.1.2.1 Querying Edges That Meet Filter Criteria

Function

This API is used to query edges that meet filter criteria.

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URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=query

Table 4-46 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-47 Request body parameters

Parameter	Mandatory	Type	Description
labels	Either **labels** or **edgeFilters** is mandatory.	String	Filter criteria of the relationship type
edgeFilters	Either **labels** or **edgeFilters** is mandatory.	String	Filter criteria, in JSONArray format. Vertices are filtered by property.
offset	No	Integer	Start position of the request
limit	No	Integer	Expected number of edges returned by a query
sorts	No	Object	Result sorting property. It is in JSONArray format.

Table 4-48 sorts parameter description

Parameter	Mandatory	Type	Description
key	Either **Key** or **propertyName** is mandatory.	String	Possible values are **label** and **property**, which indicate that labels or properties are sorted.
propertyName	Either **Key** or **propertyName** is mandatory.	String	Property name

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Parameter	Mandatory	Type	Description
orderValue	No	String	Possible values are **incr** and **decr**, which indicate ascending and descending order respectively. The default value is **incr**.

Table 4-49 edgeFilters parameter structure

Parameter	Mandatory	Type	Description
propertyName	Yes	String	Property name
predicate	Yes	String	Logical relationship. Possible values are **=**, **<**, **>**, **<=**, **>=**, **range**, **has**, **hasNot** **NOTE** If the property is of the composite type, such as list or set, the predicate can only be **has** or **hasNot**.
values	No	String	Property value.
type	No	String	Logical relationship of filter criteria. Possible values are **and** and **or**. The default value is **and**.

Response Parameters

Table 4-50 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.

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Parameter	Type	Description
jobId	String	ID of the edge query job **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.

Example Request

Query edges that meet filter criteria. The start position of the request is **0**, the number of edges to be returned is **20**, and the filter criterion of the relationship type is **rate**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=query
{
   "offset":"0",
   "limit":"20",
   "labels":[
      "rate"
   ],
   "edgeFilters":[
      {
         "propertyName":"Score",
         "predicate":">=",
         "values":[
            "2"
         ]
      },
      {
         "propertyName":"Datetime",
         "predicate":"range",
         "values":[
            "1998-12-27 01:00:00",
            "2000-12-31 00:12:38"
         ],
         "type":"or"
      }
   ]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
  "jobId": "f9987cab-64d3-4b3d-ac43-e91ae0c21bef168127124",
  "jobType": 0
}
```

Status code: 400

Example response for a failed request

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```
Http Status Code: 400
{
  "errorMessage": "Bad Request, parameter labels and edgeFilters cannot all be null",
  "errorCode": "GES.8103"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.2.2 Querying Edge Details

Function

This API is used to query the detailed information about an edge based on the source vertex, target vertex, and index of the edge. Information about edges and properties is returned.

URI

```
GET /ges/v1.0/{project_id}/graphs/{graph_name}/edges/detail?
source={sourceVertex}&target={targetVertex}&index={index}
```

Table 4-51 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Request Parameters

Table 4-52 Request body parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
sourceVertex	Yes	String	Source vertex of an edge
targetVertex	Yes	String	Target vertex of an edge
index	No	Integer	Edge index. If this parameter is not set, all edges between the source and target vertices are queried

Response Parameters

Table 4-53 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Query results. If the query is successful, the query result will be returned. If the query fails, this parameter will be left blank.

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Table 4-54 data parameter description

Parameter	Mandatory	Type	Description
edges	Yes	List	Edge result set. If no edge is found, this parameter will be left blank.

Example Request

Query details about an edge.

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/detail?
source=Ray&target=Rocky&index=6
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200

{
   "data": {
      "edges": [
         {
            "index": "6",
            "source": "Ray",
            "label": "rate",
            "properties": {
               "Score": [
                  3
               ],
               "Datetime": [
                  "2000-11-22 19:23:05"
               ]
            },
            "target": "Rocky"
         }
      ]
   }
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
"errorMessage":"graph [demo] is not found",
"errorCode":"GES.8107"
}
```

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Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.2.3 Adding an Edge

Function

This API is used to add an edge.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges

Table 4-55 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Request Parameters

Table 4-56 Request body parameters

Parameter	Mandatory	Type	Description
source	Yes	String	Source vertex name
target	Yes	String	Target vertex name
label	No	String	Label of an edge. If no label exists, set it to **__DEFAULT__**.
properties	No	Object	Value of each property
parallelEdge	No	**parallelEdge** Object	How to process repetitive edges

Table 4-57 parallelEdge parameter description

Parameter	Mandatory	Type	Description
action	No	String	Processing mode of repetitive edges. The value can be **allow**, **ignore**, or **override**. The default value is **allow**. • **allow** indicates that repetitive edges are allowed. • **ignore** indicates that subsequent repetitive edges are ignored. • **override** indicates that the previous repetitive edges are overwritten.

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Parameter	Mandatory	Type	Description
ignoreLabel	No	Boolean	Whether to ignore labels on repetitive edges. The value is **true** or **false**, and the default value is **true**. • **true**: Indicates that the repetitive edge definition does not contain the label. That is, the <source vertex, target vertex> indicates an edge, excluding the label information. • **false**: indicates that the repetitive edge definition contains the label. That is, <Source vertex, Target vertex, Label> indicates an edge.
targetProperties	No	**targetProperties** Array	List of properties used to determine repetitive edges. If this parameter is specified, **ignoreLabel** is set to **false** to define repetitive edges that contain properties in the list specified by this parameter. (This parameter is mandatory only when **action** is set to **override**.) **NOTE** • The current version supports only overwriting by property and does not support ignoring by property. In addition, only one property takes effect for each label. • Properties of the non-single type are considered unequal.

Table 4-58 targetProperties parameter description

Parameter	Mandatory	Type	Description
label	Yes	String	Labels whose repetitive edges need to be determined by property
properties	Yes	Array	List of properties whose repetitive edges need to be determined by property. Currently, only one property is supported. If multiple properties are entered, the first property is used.

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Response Parameters

Table 4-59 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.
data	Object	Query results. If the query is successful, the query results are returned. If the query fails, this parameter is left blank.

Example Request

Add an edge. The source name is **Lily**, the target name is **Rocky**, and the label name of the edge is **rate**.

```
POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges
{
    "source": "Lily",
    "target": "Rocky",
    "label": "rate",
    "properties": {
        "Score": [
            5
        ],
        "Datetime": [
            "2018-01-01 20:30:05"
        ]
    },
    "parallelEdge": {
        "action": "override",
        "ignoreLabel": true,
        "targetProperties": [
            {
                "label": "rate",
                "properties": [
                    "Datetime"
                ]
            },
            {
                "label": "superclassOf",
                "properties": [
                    "popularity"
```

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```
          ]
        }
      ]
    }
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
 "result":"success",
 "data":{"index":"0"}
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage":"edge source vertex [Lily] does not exist",
 "errorCode":"GES.8000"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.2.4 Deleting an Edge

Function

This API is used to delete an edge based on the specified property value or index.

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URI

DELETE /ges/v1.0/{project_id}/graphs/{graph_name}/edges?source={sourceVertex}&target={targetVertex}&index={index}&label={label}&property={name}&value={value}

Request Parameters

Table 4-60 Request body parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
source	Yes	String	Source vertex name
target	Yes	String	Target vertex name
index	No	Integer	Edge index • If **property** has been set, ignore this parameter. • If **property** is not set, the edge is deleted based on **index**. • If neither **property** nor **index** is set, all edges between **source** and **target** are deleted.
label	No	String	Indicates the label of an edge, which can accelerate the search of property values. This parameter must be used together with **property**.
property	No	String	Property name of the edge to be deleted. This parameter must be used together with **value**.
value	No	String	Indicates the property value of the edge to be deleted. This parameter must be used together with **property**.

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Example Request

Delete an edge. The source vertex name of the edge to be deleted is **Vivian**, the target vertex name is **Lethal**, the edge index value is **0**, the edge label value is **rate**, the property name is **Score**, and the property value is **5**.

```
DELETE http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges?
source=Vivian&target=Lethal Weapon&index=0&label=rate&property=Score&value=5
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Response Parameters

Table 4-61 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
   "errorMessage": "edge source vertex [Lily] does not exist",
   "errorCode": "GES.8000"
}
```

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Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.2.5 Updating Edge Properties

Function

This API is used to update edge property values. The operations include ADD, UPDATE, and DEL.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges/properties/action?action_id={actionId}&source={sourceVertex}&target={targetVertex}&index={index}

Table 4-62 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
actionId	Yes	String	Operator. Possible values: • **update**: Update a property value. • **add**: Add a property value. When the property's **cardinality** is **single**, the operation is the same as that of UPDATE. When **cardinality** is **list** or **set**, the operator adds a value to a set. • **del**: Delete a property value.
sourceVertex	Yes	String	Source vertex of an edge

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Parameter	Mandatory	Type	Description
targetVertex	Yes	String	Target vertex of an edge
index	No	Integer	Edge index. If this parameter is not set, properties of the first edge between the vertices will be modified.

Request Parameters

Table 4-63 Request body parameters

Parameter	Mandatory	Type	Description
properties	Yes	Object	Value of each property
targetProperties	No	Array	Properties used to determine duplicate edges. • If this parameter is not left blank, other properties of duplicate edges (with the same source vertex and target vertex) that has the same property value as the input property value will be overwritten. If there are multiple specified properties, the properties of the first edge that is matched based on the property input sequence are modified. • If this parameter is left blank or no property is specified for the input edge, the first edge that meets the criteria is updated. For details about the property elements, see **Table 4-64**.

Table 4-64 targetProperty parameter description

Parameter	Mandatory	Type	Description
label	Yes	String	Label name. The label of duplicate edges is determined by the property.

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Parameter	Mandatory	Type	Description
properties	Yes	Array	Value of each property. The property list of duplicate edges is determined by the property. Currently, only a single property is supported. If multiple properties are entered, the first property is used.

Example Request

Update the property value of an edge. The value of property **Rating** is **7**, the value of property **Datetime** is **2020-12-27 23:44:41**, and the label name is **rate**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/properties/action?action_id=update&source=Lily&target=Tom&index=1
{
    "properties": {
        "Rating": ["7"],
        "Datetime":["2020-12-27 23:44:41"]
    },
    "targetProperties": [
    {
      "label": "rate",
      "properties": [
        "Rating"
      ]
    }
  ]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Response Parameters

Table 4-65 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.

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Parameter	Type	Description
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
 "result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage": "edge [Lily-Tom-1] does not exist",
 "errorCode": "GES.8221"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.2.6 Querying Edge Data in Batches

Function

This API is used to query the detailed information about edges in batches based on the source vertices, target vertices, and indexes of the edges. Information about edges and properties is returned.

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URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=batch-query

Table 4-66 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-67 Request body parameter

Parameter	Mandatory	Type	Description
edges	Yes	Object	Edge array to be queried

Table 4-68 edges parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Source vertex of an edge
target	Yes	String	Target vertex of an edge
index	No	String	Edge index

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Response Parameters

Table 4-69 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	String	The **data** field is contained when the query is successful, and the **data** field contains the edges query result.

Example Request

Query details about edges in batches based on the source vertex, target vertex, and index. The source nodes of the edges to be queried are **39631050_Landscape** and **27803870_Landmark building**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=batch-query
{
        "edges": [{
            "source": "39631050_Landscape",
            "target": "27803870_ Landmark building"
         },{
            "index": "0",
            "source": "27803870_Landmark building",
            "target": "27661363_ Jiuhua Hot Spring"
         }]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
{
   "data": {
      "edges": [
         {
            "index": "24",
```

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```
            "source": "39631050_Landscape",
            "label": "superclassOf",
            "properties": {
                "popularity": [
                    0
                ]
            },
            "target": "27803870_ Landmark building"
        },
        {
            "index": "0",
            "source": "27803870_Landmark building",
            "label": "superclassOf",
            "properties": {
                "popularity": [
                    0
                ]
            },
            "target": "27661363_ Jiuhua Hot Spring"
        }
    ]
  }
}
```


Status code: 400

Example response for a failed request


```
Http Status Code: 400
{
 "errorMessage":"parameter does not contain 'source'",
 "errorCode":"GES.8000"
}
```


Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.2.7 Adding Edges in Batches

Function

This API is used to add edges in batches.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=batch-add

Table 4-70 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Parameter	Mandatory	Type	Description
edges	Yes	Object	Edge array to be added
parallelEdge	No	**parallelEdge** Object	Repetitive edge processing
createNotExists	No	Boolean	Whether to add source or target vertices that do not exist in the **edges** parameter before adding edges. The default value is **false**, which does not affect the original functions and semantics. If this parameter is set to **true**, source or target vertices that do not exist in the **edges** parameter are added prior to the edges.

Table 4-71 edges parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Source vertex of an edge
target	Yes	String	Target vertex of an edge

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Parameter	Mandatory	Type	Description
label	Yes	String	Edge label
properties	No	Object	Value of each property

Table 4-72 parallelEdge parameter description

Parameter	Mandatory	Type	Description
action	No	String	Processing mode of repetitive edges. The value can be **allow**, **ignore**, or **override**. The default value is **allow**. • **allow** indicates that repetitive edges are allowed. • **ignore** indicates that subsequent repetitive edges are ignored. • **override** indicates that the previous repetitive edges are overwritten.
ignoreLabel	No	Boolean	Whether to ignore labels on repetitive edges. The value is **true** or **false**, and the default value is **true**. • **true**: Indicates that the repetitive edge definition does not contain the label. That is, the <source vertex, target vertex> indicates an edge, excluding the label information. • **false**: indicates that the repetitive edge definition contains the label. That is, <Source vertex, Target vertex, Label> indicates an edge.

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Parameter	Mandatory	Type	Description
targetProperties	No	**targetProperties** Array	Properties used to determine duplicate edges. If this parameter is specified, **ignoreLabel** is set to **false** to define repetitive edges that contain properties in the list specified by this parameter. (This parameter is mandatory only when **action** is set to **override**.) **NOTE** • The current version supports only overwriting by property and does not support ignoring by property. In addition, only one property takes effect for each label. • Properties of the non-single type are considered unequal.

Table 4-73 targetProperties parameter description

Parameter	Mandatory	Type	Description
label	Yes	String	Labels whose repetitive edges need to be determined by property
properties	Yes	Array	List of properties whose repetitive edges need to be determined by property. Currently, only one property is supported. If multiple properties are entered, the first property is used.

Response Parameters

Table 4-74 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.

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Parameter	Type	Description
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Add edges in batches. The source vertex is **46**, the target vertices are **39** and **38**, and the edge label is **rate**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=batch-add
{
    "parallelEdge": {
        "action": "override",
        "ignoreLabel": false,
        "targetProperties": [
            {
                "label": "rate",
                "properties": [
                    "Datetime"
                ]
            },
            {
                "label": "superclassOf",
                "properties": [
                    "popularity"
                ]
            }
        ]
    },
    "createNotExists": true,
    "edges": [
        {
            "source": "46",
            "target": "39",
            "label": "rate",
            "properties": {
                "Rating": [
                    5
                ],
                "Datetime": [
                    "2018-01-01 20:30:05"
                ]
            }
        },
        {
            "source": "46",
            "target": "39",
            "label": "rate",
            "properties": {
                "Rating": [
                    4
                ],
                "Datetime": [
                    "2018-01-01 20:30:05"
```

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```
          ]
        }
      }
    ]
}
```

NOTE

- **SERVER_URL**: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.
- In the example, if vertices **666** and **777** are not in the original graph, create vertices **666** and **777**, retain the default value of each label, and add an edge.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
 "result":"success",
 "data": {
    "edges": [
       {
          "index": "7",
          "source": "46",
          "target": "39"
       },
       {
          "index": "0",
          "source": "46",
          "target": "38"
       }
    ]
 }
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage":"edge source vertex [Lily] does not exist",
 "errorCode":"GES.8000"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

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Error Codes

See **Error Codes**.

4.1.2.8 Deleting Edges in Batches

Function

This API is used to delete edges in batches based on the source vertices, target vertices, and indexes of the edges.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=batch-delete

Table 4-75 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Example Request

Delete edges in batches. The source vertices of the edges are **39631050_Landscape** and **27803870_Landmark building**, and the target vertices of the edges are **27803870_Landmark building** and **27661363_Villa hot spring**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=batch-delete
{
   "edges": [
      {
            "source": "39631050_Landscape",
            "target": "27803870_ Landmark building"
      },
      {
         "index": "0",
            "source": "27803870_Landmark building",
         "target": "27661363_Villa hot spring"
      }
   ],
   "ignoreError": true
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

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Request Parameters

Table 4-76 Request body parameters

Parameter	Mandatory	Type	Description
edges	Yes	Object	Edge array to be deleted
executionMode	No	String	**sync** indicates the synchronous mode, and **async** indicates the asynchronous mode. The default value is **sync**.
ignoreError	No	Boolean	Whether to ignore errors, for example, the edge to delete does not exist. The default value is **false**, indicating that errors will not be ignored. Errors in JSON format cannot be ignored.

Table 4-77 edges parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Source vertex of an edge
target	Yes	String	Target vertex of an edge
index	No	String	Edge index
label	No	String	Label of an edge. If the **index** parameter is set, this parameter is ignored. If the **index** parameter is not set, an edge that meets the **source**, **target**, and **label** conditions is deleted. If the specified **label** value does not exist in the schema or the edge with the same **label** does not exist, no edge will be deleted.

Response Parameters

- Synchronous call

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Table 4-78 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage":"parameter does not contain 'source'",
 "errorCode":"GES.8000"
}
```

- Asynchronous call

Table 4-79 Response body parameters

Parameter	Mandatory	Type	Description
errorMessage	No	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.

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Parameter	Mandatory	Type	Description
errorCode	No	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	No	String	ID of the deletion job. This parameter is left blank when the request fails. This ID can be used as a request parameter to obtain the deletion result through the API for querying the job status.
jobType	No	Integer	Job type. This parameter is left blank when the request fails.

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"jobId": "500dea8f-9651-41fe-8299-c20f13a032ea",
"jobType": 3
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
"errorMessage": "graph [test_117d] is not found",
"errorCode": "GES.8402"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

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Error Codes

See **Error Codes**.

4.1.2.9 Updating Edge Properties in Batches

Function

This API is used to update edge properties in batches.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges/properties/action?action_id={actionId}

Table 4-80 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
actionId	Yes	String	Operator. Possible values: • **batch-update**: Update the value of a property. • **batch-add**: Add the value to a property. When the property's **cardinality** is **single**, the operation is the same as that of **batch-update**. When **cardinality** is **list** or **set**, the operator adds a value to a set. • **batch-del**: Delete a property value.

Request Parameters

Table 4-81 Request body parameters

Parameter	Mandatory	Type	Description
edges	Yes	Json	Edge array to be updated

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Parameter	Mandatory	Type	Description
ignoreError	No	Boolean	Whether to ignore the update error of specific edges. The default value is **false**, indicating that an error that causes the update failure must be detected. For example, if the edge to be updated does not exist, an error is reported and no edge is updated. If the value is **true**, similar errors are ignored and other edge properties without errors are updated.

Table 4-82 edges parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Source vertex of an edge
target	Yes	String	Target vertex of an edge
index	No	String	Edge index. If this parameter is not set, the first edge between vertices is updated.
properties	Yes	Object	Value of each property

Response Parameters

Table 4-83 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

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Example Request

Update edge properties in batches. The source vertex of the edge is **46**, and the target vertices of the edge are **39** and **38**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/properties/action?
action_id=batch-update
{
   "edges": [
      {
         "source": "46",
         "target": "39",
         "properties": {
            "Rating": [
               5
            ],
            "Datetime": [
               "2018-01-0120:30:05"
            ]
         }
      },
      {
         "source": "46",
         "target": "38",
         "index": "0",
         "properties": {
            "Rating": [
               4
            ],
            "Datetime": [
               "2018-01-0120:30:05"
            ]
         }
      }
   ],
      "ignoreError": true
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
 "result":"success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage":"edge source vertex [46] does not exist",
 "errorCode":"GES.8221"
}
```

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Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.2.10 Exporting Filtered Edges

Function

This API is used to export the edge set that meets the filter criteria.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=export

Request Parameters

Table 4-84 Request body parameters

Parameter	Mandatory	Type	Description
exportPath	Yes	String	Export path
fileName	No	String	Name of the exported file
obsParameters	Yes	String	OBS authentication parameters. For details, see **Table 4-243**.
labels	Either **labels** or **edgeFilters** is mandatory.	String	Filter criteria of the relationship type

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Parameter	Mandatory	Type	Description
edgeFilters	Either **labels** or **edgeFilters** is mandatory.	String	Filter criteria, in JSONArray format. Vertices are filtered by property. For details, see **Table 4-49**.

Response Parameters

Table 4-85 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of the edge query job **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.
jobType	String	Type of an asynchronous job

Example Request

Export edges that meet filter criteria (only the asynchronous mode is supported). The relationship type filter criterion is **rate**, the property names are **Score** and **Datetime**, and the export path is **demo_movie/**.

```
POST https://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=export
 {
   "labels": [
      "rate"
   ],
   "edgeFilters": [
      {
         "propertyName": "Score",
         "predicate": ">=",
         "values": [
            "2"
         ]
      },
```

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```
    {
      "propertyName": "Datetime",
      "predicate": "range",
      "values": [
        "1998-12-27 01:00:00",
        "2000-12-31 00:12:38"
      ],
      "type": "or"
    }
  ],
  "exportPath": "demo_movie/",
  "fileName": "export_rate.csv",
  "obsParameters": {
    "accessKey": "XXXXXXX",
    "secretKey": "XXXXXXX"
  }
}
```

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
  "jobId": "03e774f5-29ea-4187-9508-5435f3892ead016886200",
  "jobType": 0
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "Bad Request, parameter labels and vertexFilters cannot all be null",
  "errorCode": "GES.8103"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

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4.1.2.11 Deleting Filtered Edges

Function

This API is used to delete the edge set that meets the filter criteria.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=delete

Request Parameters

Table 4-86 Request body parameters

Parameter	Mandatory	Type	Description
labels	Either **labels** or **edgeFilters** is mandatory.	String	Filter criteria of the relationship type
edgeFilters	Either **labels** or **edgeFilters** is mandatory.	String	Filter criteria, in JSONArray format. Vertices are filtered by property. For details, see **Table 4-49**.

Response Parameters

Table 4-87 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
job_id	String	ID of the edge query job **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.

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Parameter	Type	Description
jobType	String	Type of an asynchronous job

Example Request

Delete edges that meet filter criteria (only the asynchronous mode is supported). The relationship type filter criterion is **rate**, and the property names are **Score** and **Datetime**.

```
POST https://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=delete
 {
   "labels": [
      "rate"
   ],
   "edgeFilters": [
      {
         "propertyName": "Score",
         "predicate": ">=",
         "values": [
            "2"
         ]
      },
      {
         "propertyName": "Datetime",
         "predicate": "range",
         "values": [
            "1998-12-27 01:00:00",
            "2000-12-31 00:12:38"
         ],
         "type": "or"
      }
   ]
 }
```

```
POST https://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=delete
 {
   "labels": [
      "rate"
   ],
   "edgeFilters": [
      {
         "propertyName": "Score",
         "predicate": ">=",
         "values": [
            "2"
         ]
      },
      {
         "propertyName": "Datetime",
         "predicate": "range",
         "values": [
            "1998-12-27 01:00:00",
            "2000-12-31 00:12:38"
         ],
         "type": "or"
      }
   ]
 }
```

Example Response

Status code: 200

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Example response for a successful request

```
Http Status Code: 200
{
  "jobId": "f9987cab-64d3-4b3d-ac43-e91ae0c21bef168127124",
  "jobType": 0
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "Bad Request, parameter labels and edgeFilters cannot all be null",
  "errorCode": "GES.8103"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.3 Metadata Operation APIs

4.1.3.1 Adding a Label

Function

This API is used to add a label.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/schema/labels

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Table 4-88 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

- Request parameters (OBS scenario)

Table 4-89 Request body parameters

Parameter	Mandatory	Type	Description
name	Yes	String	Name of a label A label name can contain a maximum of 256 characters. Only letters, digits, spaces, and special characters %,@,#,$,:,?,*, .,+,- are allowed.
type	No	String	Label type, indicating that the label is used for vertices or edges. The value can be **vertex**, **edge**, or **all**. The default value is **all**, indicating that the label applies to vertices and edges.
properties	Yes	Object	Properties you want to add to the label. For details about the object, see **properties elements**.

Table 4-90 properties elements

Parameter	Mandatory	Type	Description
property	No	Object	Label properties. For details about the object, see **Table 4 property elements**.

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Table 4-91 property parameters

Parameter	Mandatory	Type	Description
name	Yes	String	Property name 1. A property name can contain a maximum of 256 characters. 2. A property name cannot contain <, >, &, ASCII 14,15 or 30. 3. The property under a label must be unique.
cardinality	Yes	String	Cardinality type of a property. Possible values: • single • list • set
dataType	Yes	String	Data type of a property. For details, see the metadata types in **Table 3-119**.
typeNameCount	No (This parameter is mandatory if **dataType** is **enum**.)	String	Total number of parameters of the **enum** type. This parameter controls the **typeName** quantity.
typeName*	No (This parameter is mandatory if **dataType** is **enum**.)	String	Names of parameters of the **enum** type. For example, if the value of **typeNameCount** is **2**, the parameter contains **typeName1:science** and **typeName2:literature**.

Response Parameters

Table 4-92 Parameter description

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.

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Parameter	Type	Description
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Add a label. The label name is **book**. The label has three properties to add.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/schema/labels
{
  "name": "book",
  "type": "vertex",
  "properties": [
    {
      "property": {
        "name": "Title",
        "cardinality": "single",
        "dataType": "string"
      }
    },
    {
      "property": {
        "name": "Version",
        "cardinality": "single",
        "dataType": "string"
      }
    },
    {
      "property": {
        "name": "Category",
        "typeName1": "science",
        "typeName2": "literature",
        "typeNameCount": "2",
        "cardinality": "single",
        "dataType": "enum"
      }
    }
  ]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
```

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```
 "result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
 {
  "errorMessage": "label already exists",
  "errorCode": "GES.8801"
 }
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.3.2 Updating a Label

Function

In the current version, this API can only add properties to the end of existing labels, but cannot delete existing properties or update the property sequence.

URI

```
POST /ges/v1.0/{project_id}/graphs/{graph_name}/schema/labels/{label_name}/properties
```

Table 4-93 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Parameter	Mandatory	Type	Description
label_name	Yes	String	Label name

Request Parameters

Table 4-94 Request body parameters

Parameter	Mandatory	Type	Description
name	No	String	Name of a label. A label name can contain a maximum of 256 characters. Only letters, digits, spaces, and special characters %,@,#,$,:,?,*, .,+,- are allowed.
properties	Yes	Object	Property array to be appended. For details about the object, see **properties elements**.

Table 4-95 properties elements

Parameter	Mandatory	Type	Description
property	No	Object	Label properties. For details about the object, see **Table 4 property elements**.

Table 4-96 property parameters

Parameter	Mandatory	Type	Description
name	Yes	String	Property name 1. A property name can contain a maximum of 256 characters. 2. A property name cannot contain <, >, &, ASCCI 14,15 and 30. 3. The property under a label must be unique.

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Parameter	Mandatory	Type	Description
cardinality	Yes	String	Composite type of a property. Possible values: • single • list • set
dataType	Yes	String	Data type of a property. For details, see the metadata types in Table 3-119.
typeNameCount	No (This parameter is mandatory if **dataType** is **enum**.)	String	Total number of parameters of the **enum** type. This parameter controls the **typeName** quantity.
typeName*	No (This parameter is mandatory if **dataType** is **enum**.)	String	Names of parameters of the **enum** type. For example, if the value of **typeNameCount** is **2**, the parameter contains **typeName1:science** and **typeName2:literature**.

Response Parameters

Table 4-97 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Update a label. The label name is **book**. The label has three properties to update.

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```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/schema/labels/{label_name}/
properties
{
  "name": "book",
  "properties": [
    {
      "property": {
        "name": "Title",
        "cardinality": "single",
        "dataType": "string"
      }
    },
    {
      "property": {
        "name": "Version",
        "cardinality": "single",
        "dataType": "string"
      }
    },
    {
      "property": {
        "name": "Category",
        "typeName1": "science",
        "typeName2": "literature",
        "typeNameCount": "2",
        "dataType": "enum"
      }
    }
  ]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
 "result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
 {
  "errorMessage": "label already exists",
  "errorCode": "GES.8801"
 }
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.

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Return Value	Description
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.3.3 Querying Graph Metadata Details

Function

This API is used to query graph metadata details.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/schema

Table 4-98 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

None

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Response Parameters

Table 4-99 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Query results. This parameter is left blank when the request fails.

Table 4-100 data parameter description

Parameter	Type	Description
schema	List	Definitions of each label and associated property field

Example Request

Query metadata details of a graph.

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/schema
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200

{
   "data": {
      "schema": [
         {
            "label": "__DEFAULT__",
            "type": "all"
         },
```

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```
{
   "label": "friends",
   "type": "edge"
},
{
   "label": "movie",
   "type": "vertex",
   "properties": [
      {
         "name": "Title",
         "type": "string",
         "cardinality": "single"
      },
      {
         "name": "Year",
         "type": "int",
         "cardinality": "single"
      },
      {
         "name": "Genres",
         "type": "string",
         "cardinality": "set"
      }
   ]
},

{
   "label": "user",
   "type": "vertex",
   "properties": [
      {
         "name": "Name",
         "type": "string",
         "cardinality": "single"
      },
      {
         "name": "Gender",
         "probableValue": [
            "",
            "F",
            "M"
         ],
         "type": "enum",
         "cardinality": "single"
      },
      {
         "name": "Age",
         "probableValue": [
            "",
            "Under 18",
            "18-24",
            "25-34",
            "35-44",
            "45-49",
            "50-55",
            "56+"
         ],
         "type": "enum",
         "cardinality": "single"
      },
      {
         "name": "Occupation",
         "type": "string",
         "cardinality": "single"
      },
      {
         "name": "Zip-code",
         "type": "char array",
         "cardinality": "single
```

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```
"
            }
          ]
        },
        {
          "label": "rate",
          "type": "edge",
          "properties": [
            {
              "name": "Score",
              "type": "int",
              "cardinality": "single"
            },
            {
              "name": "Datetime",
              "type": "date",
              "cardinality": "single"
            }
          ]
        }
      ]
    }
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "graph [demo] is not found",
  "errorCode": "GES.8003"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.3.4 Changing Property Names in Batches

Function

This API is used to change property names in batches.

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URI

PUT /ges/v1.0/{project_id}/graphs/{graph_name}/schema/labels/properties

Table 4-101 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-102 Request body parameters

Parameter	Mandatory	Type	Description
labels	Yes	JsonArray	Label array
label	Yes	String	Name of a label
originPropertyName	Yes	String	Original property name
updatedProperty-Name	Yes	String	New property name

Response Parameters

Table 4-103 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.

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Parameter	Type	Description
updated_count	Integer	Number of properties that are successfully updated

Example Request

Change label property names in batches. The label name is **movie**, the original property name is **title**, and the new property name is **movie_title**. The label name is **movie**, the original property name is **newProperty**, and the new property name is **xxxxProperty**. The label name is **user**, the original property name is **gender**, and the new property name is **sexuality**.

```
PUT  http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/schema/labels/properties
{
   "labels": [{
         "label": "movie",
         "originPropertyName": "title",
         "updatedPropertyName": "movie_title"
      },
      {
         "label": "movie",
         "originPropertyName": "newProperty",
         "updatedPropertyName": "xxxxProperty"
      },
      {
         "label": "user",
         "originPropertyName": "gender",
         "updatedPropertyName": "sexuality"
      }
   ]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
 "updated_count": 4
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
 {
  "errorMessage": "label name does not exist",
  "errorCode": "GES.8807"
 }
```

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Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.3.5 Deleting a Label

Function

This API is used to delete a label as well as the vertices and edges associated with the label.

URI

DELETE /ges/v1.0/{project_id}/graphs/{graph_name}/schema/labels/{labelName}

Table 4-104 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
label_name	Yes	String	Name of a label

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Response Parameters

Table 4-105 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Query results. This parameter is left blank when the request fails.

Table 4-106 data parameter description

Parameter	Type	Description
outputs	Integer	Number of deleted vertices or edges when a label is deleted.

Example Request

Delete a label as well as the vertices and edges associated with the label.

```
DELETE http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/schema/labels/{labelName}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
   "data": {
      "outputs": 3
   },
   "status": "success"
}
```

Status code: 400

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Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "graph [demo] is not found",
  "errorCode": "GES.8003"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.3.6 Adding Labels in Batches

Function

This API is used to add labels in batches.

URI

```
POST /ges/v1.0/{project_id}/graphs/{graph_name}/schema/labels/action?action_id=batch-add
```

Table 4-107 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Request Parameters

Table 4-108 Request body parameters

Parameter	Mandatory	Type	Description
labels	Yes	String	Metadata labels

Table 4-109 label parameters

Parameter	Mandatory	Type	Description
name	Yes	String	Name of a label. The value can contain a maximum of 256 characters, including numbers, spaces, and the following special characters: % @ # $:? *. + - _.
type	No	String	Label type, indicating that the label is used for vertices or edges. The value can be **vertex**, **edge**, or **all**. The default value is **all**, indicating that the label applies to vertices and edges.
properties	Yes	Object	Property array to be added. The array element is property. For details about the parameters, see **Table 4-110**.

Table 4-110 property parameter description

Parameter	Mandatory	Type	Description
name	Yes	String	Property name 1. A property name can contain a maximum of 256 characters. 2. A property name cannot contain <, >, &, ASCII 14, 15 or 30. 3. The property under a label must be unique.
cardinality	Yes	String	Cardinality type of a property. Possible values: • single • list • set
dataType	Yes	String	Data type of a property. For details, see the metadata types in **Table 3-119**.

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Parameter	Mandatory	Type	Description
typeNameCount	No (This parameter is mandatory if **dataType** is **enum**.)	String	Total number of parameters of the **enum** type. This parameter controls the **typeName** quantity.
typeName*	No (This parameter is mandatory if **dataType** is **enum**.)	String	Names of parameters of the **enum** type. For example, if the value of **typeNameCount** is **2**, the parameter contains **typeName1:science** and **typeName2:literature**.

Response Parameters

Table 4-111 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.
data	Object	If some labels fail to be added, this field contains the names of the failed labels and the failure causes.

Example Request

Add metadata labels and their properties in batches. The names of the metadata labels are **book** and **movie**.

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```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/schema/labels/action?
action_id=batch-add
{
   "labels": [
      {
         "name": "book",
         "type": "vertex",
         "properties": [
            {
               "property": {
                  "name": "title",
                  "cardinality": "single",
                  "dataType": "string"
               }
            }
         ]
      },
      {
         "name": "movie",
         "type": "vertex",
         "properties": [
            {
               "property": {
                  "name": "movieid",
                  "cardinality": "single",
                  "dataType": "int"
               }
            }
         ]
      }
   ]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
 "result": "success"
}
```

Example response for a partially successful request

```
Http Status Code: 200
{
   "result": "partial success",
   "data": {
      "failed": [
         {
            "cause": "label name is invalid  which can only contain letters, digits, space,%,@,#,$,:,?,*,.,+,- and
_",
            "labelName": "book<"
         }
      ]
   }
}
```

Status code: 400

Example response for a failed request

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```
Http Status Code: 400
 {
  "errorMessage": "label already exists",
  "errorCode": "GES.8801"
 }
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.3.7 Querying a Schema

Function

This API is used to query a generated schema (obtained from OBS).

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/schema/structure?detail={details}

Table 4-112 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Parameter	Mandatory	Type	Description
details	No	String	Detailed information of the schema. The value can be **SIMPLE** or **FULL**. If you set this parameter to **SIMPLE**, only the labels of vertices or edges are returned. If you set it to **FULL**, the number of vertices or edges is returned in addition to the labels. If this parameter is left empty, the default value **SIMPLE** is used.

Response Parameters

Table 4-113 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
schema	Object	Schema structure. For details, see **schema parameter description**.

Table 4-114 schema parameter description

Parameter	Type	Description
vertices	String	Vertex result set. If the graph is empty, the return value is empty. For details, see **vertices parameter description**.
edges	String	Edge result set. If the graph is empty, the return value is empty. For details, see **edges parameter description**.

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Table 4-115 vertices parameter description

Parameter	Type	Description
vertex	String	Label name
weight	String	Number of vertices that have the label

Table 4-116 edges parameter description

Parameter	Type	Description
source	String	Label the start vertex.
target	String	Label the end vertex.
relation	String	Relationship label
weight	String	Number of edges that have the label

Example Request

Query a generated schema (obtained from OBS).

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/schema/structure?detail=SIMPLE
```

Example Response

Status code: 200

Example response for a successful request

```
{
   "schema": {
      "vertices": [
         {
            "vertex": "user",
            "weight": 100
         },
         {
            "vertex": "movie",
            "weight": 46
         }
      ],
      "edges": [
         {
            "weight": 1209,
            "source": "user",
            "target": "movie",
            "relation": "rate"
         },
         {
            "weight": 450,
            "source": "user",
            "target": "user",
            "relation": "default"
         }
      ]
   }
}
```

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Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
    "errorMessage": "Bad Request, parameter [detail] cannot be null.",
    "errorCode": "GES.8813"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.3.8 Generating a Schema

Function

This API is used to generate a schema where labels are represented with vertices and the relationship between the labels are represented with edges, and store the schema in an OBS bucket.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/schema/structure/build

Table 4-117 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Response Parameters

Table 4-118 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of the vertex query job. This parameter is left blank when the request fails.
jobType	String	Type of an asynchronous job

Example Request

Generate a schema where labels are represented with vertices and the relationship between the labels are represented with edges.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/schema/structure/build
```

Example Response

Status code: 200

Example response for a successful request

```
{
   "jobId": "2e0c08e1-3fbb-4b33-8776-4809176068d7154236181",
   "jobType": 1
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
   "errorMessage": "Bad Request ",
   "errorCode": "GES.8813"
}
```

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Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.4 Index Operation APIs

4.1.4.1 Creating an Index

Function

This API is used to create indexes based on the specified information such as indexName and IndexType. Currently, composite indexes are supported.

- Composite indexes include global vertex indexes (GlobalCompositeVertexIndex) and global edge indexes (GlobalCompositeEdgeIndex). Composite indexes can be used to create indexes on labels and properties. Indexes can accelerate the query speed.

Index Feature

Feature	Fuzzy Search	Speed	Flexibility
Composite indexes	No	Fast	Fixed composite property keys only

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/indices

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Table 4-119 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Example Request

Create a composite index. The index name is **ageIndex** and the index type is global vertex index.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/indices
{
   "indexName":"ageIndex",
   "indexType": "GlobalCompositeVertexIndex",

   "hasLabel": "true",
   "indexProperty": ["age"]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Request Parameters

Table 4-120 Request body parameters

Parameter	Mandatory	Type	Description
indexName	Yes	String	Index name. The name can contain a maximum of 63 characters. Only letters, digits, hyphens (-), and underscores (_) are allowed.
indexType	Yes	String	Index type. The value is case-sensitive. **GlobalCompositeVertexIndex** is a global composite vertex index.
indexProperty	No (If **hasLabel** is **false** or **null**, this parameter is mandatory.)	String	Index property list Indexes can be created for the following property types: **integer**, **float**, **double**, **long**, **enum**, **char array**, **string**, and **date**.

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NOTE

If a property is of the string or char array type, the value must be no more than 40 bytes. The excess part will be deleted.

Response Parameters

Table 4-121 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of an asynchronous job **NOTE** • You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.
jobType	String	Type of an asynchronous job
result	String	If the execution is successful, the value is **success**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"jobId": "f99f60f1-bba6-4cde-bd1a-ff4bdd1fd500000168232",
"jobType": 8
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "graph [demo] is not found",
  "errorCode": "GES.8603"
}
```

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Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.4.2 Deleting an Index

Function

This API is used to delete an index based on the specified indexName.

URI

DELETE /ges/v1.0/{project_id}/graphs/{graph_name}/indices/{indexName}

Table 4-122 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
indexName	Yes	String	Index name

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Response Parameters

Table 4-123 Parameter description

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of an asynchronous job **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.
jobType	String	Type of an asynchronous job

Example Request

Delete an index by name. The index name is **ageIndex**.

```
DELETE http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/indices/ageIndex
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
  "jobId": "fb74314e-a82d-41b2-8900-96e2559fa0d9000168232",
  "jobType": 9
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "graph [demo] is not found",
```

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```
  "errorCode": "GES.8604 "
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.4.3 Querying Indexes

Function

This API is used to query all indexes created on a graph.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/indices

Table 4-124 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Response Parameters

Table 4-125 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Index data you want to query
result	String	Query results. If the query is successful, **success** is displayed.
indices	List	Indexes of the query results
indexType	String	Index types of the query results
indexName	String	Index names of the query results
indexProperty	List	Index properties of the query results

Example Request

Query all indexes created on a graph.

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/indices
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
  "data": {
    "result": "success",
    "indices": [
      {
        "indexType": "GlobalCompositeVertexIndex",
```

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```
      "indexName": "ageIndx",
      "indexProperty": [
        "age"
      ],
      "hasLabel": "true"

    }
  ]
 }
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "graph [demo] is not found",
  "errorCode": "GES.8605"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.5 Gremlin Operation APIs

4.1.5.1 Executing Gremlin Queries

Function

This API is used to return the query result of a Gremlin statement.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-gremlin-query

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Table 4-126 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-127 Request body parameter

Parameter	Mandatory	Type	Description
command	Yes	String	Query command (Gremlin language)

Response Parameters

Table 4-128 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Query results. This parameter is left blank when the request fails.

Example Request

Perform the Gremlin query operation. If the query command is **g.V().limit(100)**, all vertices are queried, but the number of returned vertices is limited to 100.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-gremlin-query
```

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```
{
   "command":"g.V().limit(100)"
}
```

NOTE

- **SERVER_URL**: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.
- The size of the request body cannot exceed 64 MB.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200

{
   "data": {
      "runtime": 0.775425022,
      "vertices": [
         {
            "id": "Vivian",
            "label": "user",
            "properties": {
               "Occupation": [
                  "artist"
               ],
               "Name": [
                  "Vivian"
               ],
               "Zip-code": [
                  "98133"
               ],
               "Gender": [
                  "F"
               ],
               "Age": [
                  "25-34"
               ]
            }
         },
         ......
      ]
   }
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
   "errorMessage": "org.apache.tinkerpop.gremlin.driver.exception.ResponseException: No such property: g1 for class: Script4",
   "errorCode": "GES.8503"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.

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Return Value	Description
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.6 Algorithm APIs

4.1.6.1 Running Algorithms

Function

This API is used to run specified algorithms based on entered parameters.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-algorithm

Table 4-129 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Example Request

Execute a specified algorithm. The algorithm name is **pagerank**, the weight coefficient is **0.85**, the convergence precision is **0.00001**, the maximum number of iterations is **1000**, and traversal is performed along edge directions.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-algorithm
{
 "algorithmName":"pagerank",
```

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```
"parameters":{
      "alpha":0.85,
      "convergence":0.00001,
      "max_iterations":1000,
      "directed":true
}
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Request Parameters

For details about the parameters, see **Common algorithm parameters**.

Response Parameters

Table 4-130 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of the algorithm execution job. This parameter is left blank when the request fails. **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.
jobType	Integer	Job type. This parameter is left blank when the request fails.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"jobId": "4448c9fb-0b16-4a78-8d89-2a137c53454a001679122",
"jobType": 1
}
```

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Status code: 4200

Example response for a failed request

```
Http Status Code: 400
{
"errorMessage":"graph [demo] is not found",
"errorCode":"GES.8402"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.6.2 Algorithm API Parameter References

4.1.6.2.1 Common Algorithm Parameters

Request Example

```
{
 "algorithmName":"XXX",
 "parameters":{
        ...
 }
}
```

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Request Parameters

Table 4-131 Request body parameters

Parameter	Mandatory	Type	Description
algorithmName	Yes	String	Algorithm name. Available values are as follows (algorithm names you can call): • pagerank • personalrank • kcore • k_hop • shortest_path • all_shortest_paths • filtered_shortest_path • sssp • shortest_path_of_vertex_sets • n_paths • closeness • label_propagation • louvain • link_prediction • node2vec • realtime_recommendation • common_neighbors • connected_component • degree_correlation • triangle_count • cluster_coefficient • common_neighbors_of_vertex_sets • all_shortest_paths_of_vertex_sets • filtered_circle_detection • filtered_all_pairs_shortest_paths • filtered_all_shortest_paths • filtered_n_paths
parameters	Yes	Object	Algorithm parameters. For details, see the parameter description of each algorithm.

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Table 4-132 New Body parameters of version 2.1.7

Parameter	Mandatory	Type	Description
executionMode	No	String	• **sync**: synchronous • **async**: asynchronous The default value is **async**. Supported algorithms are as follows (algorithm names you can call): • k_hop • shortest_path • all_shortest_paths • filtered_shortest_path • shortest_path_of_vertex_sets • n_paths • realtime_recommendation
offset	No	Integer	Synchronization result offset. The default value is **0**. **NOTE** This parameter is available when **executionMode** is **sync**. Supported algorithms are as follows (algorithm names you can call): • k_hop • shortest_path • all_shortest_paths • shortest_path_of_vertex_sets • n_paths • realtime_recommendation • filtered_all_pairs_shortest_paths • filtered_all_shortest_paths

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Parameter	Mandatory	Type	Description
limit	No	Integer	Maximum number of returned synchronization results. The maximum value is **100000**. The default value is **100000**. **NOTE** This parameter is available when **executionMode** is **sync**. Supported algorithms are as follows (algorithm names you can call): • k_hop • shortest_path • all_shortest_paths • shortest_path_of_vertex_sets • n_paths • realtime_recommendation • filtered_all_pairs_shortest_paths • filtered_all_shortest_paths

Table 4-133 New Body parameters of version 2.2.4

Parameter	Mandatory	Type	Description
vertex_filter	No	Object	Filter criteria for the vertices on a path. Supported algorithms are as follows (algorithm names you can call): • filtered_shortest_path • filtered_all_pairs_shortest_paths • filtered_all_shortest_paths For details about the format, see **Table 4-274** in "Filtered-query API".
edge_filter	No	Object	Filter criteria for the edges (relationships) on a path. Supported algorithms are as follows (algorithm names you can call): • filtered_shortest_path • filtered_all_pairs_shortest_paths • filtered_all_shortest_paths For details about the format, see **Table 4-274** in "Filtered-query API".

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Parameter	Mandatory	Type	Description
filters	No	Object	Filter criteria. Each element in the array corresponds to a filter. This parameter applies only to filtered circle detection. For details about the format, see **filters element formats**. Supported algorithms: • filtered_n_paths

Example Response

Algorithms are executed based on input parameters. You can call **Querying Job Status and Execution Results** to use the **job_id** returned by the algorithm to obtain the algorithm execution result.

Status code: 200

Example response for a successful request

```
{
   "data": {

  "outputs": {
        $response_data //Result of each algorithm. The results vary with the algorithm.
        "runtime": 1.365867,
        "data_return_size": 3,
        "data_offset": 0,
        "data_total_size": 100
   }
 },
 "status": "complete"
}
```

NOTE

response_data indicates the result of each algorithm. The results vary with algorithms.

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
"errorMessage":"Running algorithm [XXXX] error: YYYYYYYYY!",
"errorCode":"GES.8301"
}
```

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Response Parameters

Table 4-134 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. If execution succeeds, this parameter may be left blank. If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. If execution succeeds, this parameter may be left blank. If execution fails, this parameter is used to display the error code.
status	String	Returned job status for a successful query. Possible values are **waiting**, **running**, and **complete**. This parameter is left blank when the query fails.
data	Object	Algorithm execution result. This parameter is left blank when the query fails.

4.1.6.2.2 PageRank

Table 4-135 parameters parameter description

Parameter	Mandatory	Type	Description
alpha	No	Double	Weight coefficient (also called damping coefficient) The value range is between 0 and 1, excluding 0 and 1. The default value is **0.85**.
convergence	No	Double	Convergence The value range is between 0 and 1, excluding 0 and 1. The default value is **0.00001**.
max_iterations	No	Integer	Maximum iterations An integer ranging from 1 to 2147483647. For frontend calls, the range is [1,2000]. The default value is **1000**.
num_thread	No	Integer	Number of concurrent threads. The value ranges from 1 to 40. If the value is less than 1, it is automatically set to **1**. If the value is greater than 40, it is automatically set to **40**. The default value is **4**.

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Parameter	Mandatory	Type	Description
directed	No	Boolean	Whether to consider the edge direction. The value can be **true** or **false**. The default value is **true**.

NOTE

Iterations and convergence

The algorithm is terminated when either the maximum number of iterations is reached or the convergence precision is met.

1. Generally, a smaller convergence precision and larger number of iterations lead to a better effect of the algorithm.
2. To meet a certain convergence precision, you should set the number of iterations as large as possible.
3. A larger number of iterations means a longer algorithm running time. To ensure that the algorithm runs at a certain number of iterations (that is, in a fixed duration), you should set the convergence precision as small as possible.

Table 4-136 response_data parameter description

Parameter	Type	Description
pagerank	List	PageRank value of each vertex. The format is as follows: [{vertexId:rankValue},...], where **vertexId** is of the string type. **rankValue** is of the double type.

4.1.6.2.3 PersonalRank

Table 4-137 parameters parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Node ID
alpha	No	Double	Weight coefficient (also called damping coefficient) The value range is between 0 and 1, excluding 0 and 1. The default value is **0.85**.

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Parameter	Mandatory	Type	Description
convergence	No	Double	Convergence The value range is between 0 and 1, excluding 0 and 1. The default value is **0.00001**.
max_iterations	No	Integer	Maximum iterations An integer ranging from 1 to 2147483647. For frontend calls, the range is [1,2000]. The default value is **1000**.
num_thread	No	Integer	Number of concurrent threads. The value ranges from 1 to 40. If the value is less than 1, it is automatically set to **1**. If the value is greater than 40, it is automatically set to **40**. The default value is **4**.
directed	No	Boolean	Whether to consider the edge direction. The value can be **true** or **false**. The default value is **true**.

NOTE

For details about algorithm iterations and convergence, see **Iterations and Convergence of PageRank**.

Table 4-138 response_data parameter description

Parameter	Type	Description
source	String	-
personalrank	List	PersonalRank value of each vertex. The format is as follows: [{vertexId:rankValue},...], where **vertexId** is of the string type. **rankValue** is of the double type.

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4.1.6.2.4 K-core

Table 4-139 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
k	Yes	Number of cores The algorithm returns vertices whose number of cores is greater than or equal to k.	Integer	Greater than or equal to 0	-

Table 4-140 response_data parameter description

Parameter	Type	Description
coreness	List<Map<String,Integer>>	Coreness value (coreness ≥ k) of each vertex. The format is as follows: [{vertexId:corenessValue},...], where **vertexId** is of the string type. **corenessValue** is of the integer type.

4.1.6.2.5 K-hop

Table 4-141 parameters parameter descriptions

Parameter	Mandatory	Description	Type	Value Range	Default Value
k	Yes	Number of hops	Integer	1 to 100	-

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Parameter	Mandatory	Description	Type	Value Range	Default Value
num_thread	No	Integer	Number of concurrent threads. The value ranges from 1 to 40. If the value is less than 1, it is automatically set to **1**. If the value is greater than 40, it is automatically set to **40**. The default value is **4**.	-	-
source	Yes	Vertex ID	String	-	-

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Parameter	Mandatory	Description	Type	Value Range	Default Value
mode	No	Direction • OUT: Hop from the outgoing edges • IN: Hop from the incoming edges • All: Hop from edges in both directions	String	**OUT**, **IN**, or **ALL**	OUT

Table 4-142 response_data parameter descriptions

Parameter	Type	Description
vertices	List	ID of the vertex within k hops. The format is as follows: [vertexId,...], where **vertexId** is of the string type.
source	String	Source vertex ID
k	Integer	Number of hops
k_hop_neighbors	Integer	Number of vertices within k hops (excluding the source vertex)

4.1.6.2.6 Common Neighbors

Table 4-143 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
source	Yes	Source vertex ID	String	-	-
target	Yes	Target vertex ID	String	-	-

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Table 4-144 response_data parameter description

Parameter	Type	Description
vertices	List	Common neighbor vertices. The format is as follows: [vertexId,...], where **vertexId** is of the string type
common_neighbors	Integer	Number of common neighbor vertices
source	String	Source vertex ID
target	String	Target vertex ID

4.1.6.2.7 Common Neighbors of Vertex Sets

Table 4-145 Parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
sources (2.2.6)	Yes	Source vertex ID set	String	The value is in the standard CSV format. IDs are separated by commas (,), for example, **Alice, Nana**. The maximum ID number is 100000.	-
targets (2.2.6)	Yes	Target vertex ID set	String	The value is in the standard CSV format. IDs are separated by commas (,), for example, **Mike,Amy**. The maximum ID number is 100000.	-

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Parameter	Mandatory	Description	Type	Value Range	Default Value
restricted (2.2.13)	No	Whether other constraints are included	Boolean	**true** or **false** • **false**: There is no additional constraint. The found common neighbors are the intersection of the neighborhoods corresponding to the source vertex set and target vertex set. • **true**: There are additional constraints. The found common neighbors are not only the intersection of the neighborhoods corresponding to the source vertex set and target vertex set, but each vertex in the common neighbor set has at least two neighboring vertices in the source vertex set and target vertex set.	true

Table 4-146 response_data parameter description

Parameter	Type	Description
vertices	List	Common neighbor vertices. The format is as follows: [vertexId,...], where **vertexId** is of the string type.
common_neighbors	Integer	Number of common neighbors

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4.1.6.2.8 Link Prediction

Table 4-147 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
source	Yes	Source vertex ID	String	-	-
target	Yes	Target vertex ID	String	-	-

Table 4-148 response_data parameter description

Parameter	Type	Description
source	String	Source vertex ID
target	String	Target vertex ID
link_prediction	Double	Link prediction result

4.1.6.2.9 Shortest Path

Table 4-149 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
source	Yes	Source vertex ID of a path	String	-	-
target	Yes	Target vertex ID of a path	String	-	-

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Parameter	Mandatory	Description	Type	Value Range	Default Value
weight	No	Weight of an edge	String	Empty or character string • Empty: The default weight and distance of edges are **1**. • Character string: The property of the corresponding edge is the weight. If the edge does not have a property, the weight is **1** by default. **NOTE** The weight of an edge must be greater than **0**.	-
directed	No	Whether to consider the edge direction	Boolean	The value can be **true** or **false**.	false
timeWindow	No	Time window used for time filtering	Object	For details, see **Table 4-150**. **NOTE** **timeWindow** does not support the shortest path with weight. That is, parameters **timeWindow** and **weight** cannot be both specified.	-

Table 4-150 timeWindow parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
filterName	Yes	Name of the time property used for time filtering	String	Character string: The property on the corresponding vertex/edge is used as the time.	-
filterType	No	Filtering by vertex or edge	String	**V**: filtering by vertex **E**: filtering by edge **BOTH**: filtering by vertex and edge	BOTH
startTime	No	Start time	String	Date character string or timestamp	-

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Parameter	Mandatory	Description	Type	Value Range	Default Value
endTime	No	End time	String	Date character string or timestamp	-

Table 4-151 response_data parameter description

Parameter	Type	Description
path	List	Shortest path. The format is as follows: [vertexId,...] where **vertexId** is of the string type.
source	String	Source vertex ID
target	String	Target vertex ID

4.1.6.2.10 All Shortest Paths

Table 4-152 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
source	Yes	Source vertex ID of a path	String	-	-
target	Yes	Target vertex ID of a path	String	-	-
directed	No	Whether to consider the edge direction	Boolean	**true** or **false**	false

Table 4-153 response_data parameter description

Parameter	Type	Description
paths	List	All shortest paths between the source vertex and target vertex. The format is as follows: [[path1],[path2]]

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Parameter	Type	Description
paths_number	Integer	Number of paths
source	String	Source vertex ID
target	String	Target vertex ID

4.1.6.2.11 Filtered Shortest Path

Request

- Parameter description

Table 4-154 parameters parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Source vertex ID of a path
target	Yes	String	Target vertex ID of a path
directed	No	Boolean	Whether to consider the edge direction. The default value is **false**.
num_thread	No	Integer	Number of concurrent threads. The value ranges from **1** to **40**. If the value is less than **1**, it is automatically set to **1**. If the value is greater than **40**, it is automatically set to **40**. The default value is **4**.

- Request example
  - Synchronization

```
{
    "executionMode": "sync",
    "algorithmName": "filtered_shortest_path",
    "edge_filter": {
        "property_filter": {
            "leftvalue": {
                "label_name": "labelName"
            },
            "predicate": "IN",
            "rightvalue": {
                "value": [
                    "xxx",
                    "rate"
                ]
            }
        }
    },
    "vertex_filter": {
        "property_filter": {
```

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```
            "leftvalue": {
                "property_name": "title"
            },
            "predicate": "PREFIX",
            "rightvalue": {
                "value": "tr_"
            }
        }
    },
    "parameters": {
        "source": "tr_1",
        "target": "tr_117",
        "directed": true
    }
}
```

– Asynchronization

```
{
    "executionMode": "async",
    "algorithmName": "filtered_shortest_path",
    "edge_filter": {
        "property_filter": {
            "leftvalue": {
                "label_name": "labelName"
            },
            "predicate": "IN",
            "rightvalue": {
                "value": [
                    "xxx",
                    "rate"
                ]
            }
        }
    },
    "vertex_filter": {
        "property_filter": {
            "leftvalue": {
                "property_name": "title"
            },
            "predicate": "PREFIX",
            "rightvalue": {
                "value": "tr_"
            }
        }
    },
    "parameters": {
        "source": "tr_1",
        "target": "tr_117",
        "directed": true
    }
}
```

Response

- Synchronous **data** parameter description

Table 4-155 response_data parameter description

Parameter	Mandatory	Type	Description
path	Yes	List	Vertex result set. If the last layer of **filters** is vertex filtering, the **data** contains vertices.
source	Yes	String	Source vertex ID

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Parameter	Mandatory	Type	Description
target	Yes	String	Target vertex ID
runtime	Yes	Double	Algorithm running time

- Response example
  - Synchronous response example (successful request)

```
{
   "data": {
      "outputs": {
         "path": [
            "tr_1",
            "tr_5",
            "tr_26",
            "tr_117"
         ],
         "runtime": 0.735766,
         "source": "tr_1",
         "target": "tr_117"
      }
   }
}
```

  - Synchronous response example (failed request)

```
{
"errorMessage": "graph [tesdt_117] is not found",
"errorCode": "GES.8402"
}
```

- Asynchronous response parameters

Table 4-156 response_data parameter description

Parameter	Mandatory	Type	Description
errorMessage	No	String	System prompt. If execution succeeds, this parameter may be left blank. If execution fails, this parameter is used to display the error message.
errorCode	No	String	System prompt. If execution succeeds, this parameter may be left blank. If execution fails, this parameter is used to display the error code.
jobId	No	String	ID of the algorithm execution job. This parameter is left blank when the request fails.
jobType	No	Integer	Job type. This parameter is left blank when the request fails.

- Example response

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- Asynchronous response example (successful request)

```
{
"jobId": "500dea8f-9651-41fe-8299-c20f13a032ea",
"jobType": 2
}
```

- Asynchronous response example (failed request)

```
{
"errorMessage": "graph [test_117d] is not found",
"errorCode": "GES.8402"
}
```

4.1.6.2.12 SSSP

Table 4-157 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
source	Yes	Vertex ID	String	-	-
directed	No	Whether to consider the edge direction	Boolean	**true** or **false**	true

Table 4-158 response_data parameter description

Parameter	Type	Description
distance	List	Path length of each vertex in the graph from the source vertex. The format is as follows: [{vertexId:distanceValue},...], where **vertexId** is of the string type. **distanceValue** is of the double type.
source	String	Source vertex ID

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4.1.6.2.13 Shortest Path of Vertex Sets

Table 4-159 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
sources	Yes	Source vertex ID set	String	The value is in the standard CSV format. IDs are separated by commas (,), for example, **Alice, Nana**. The maximum ID number is 100000.	-
targets	Yes	Target vertex ID set	String	The value is in the standard CSV format. IDs are separated by commas (,), for example, **Alice, Nana**. The maximum ID number is 100000.	-
directed	No	Whether an edge is directed	Boolean	**true** or **false**	false
timeWindow	No	Time window used for time filtering	Object	For details, see **Table 4-160**.	-

Table 4-160 timeWindow parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
filterName	No	Name of the time property used for time filtering	String	Character string: The property on the corresponding vertex/edge is used as the time.	-
filterType	No	Filtering by vertex or edge	String	**V**: filtering by vertex **E**: filtering by edge **BOTH**: filtering by vertex and edge	BOTH
startTime	No	Start time	String	Date character string or timestamp	-
endTime	No	End time	String	Date character string or timestamp	-

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Table 4-161 response_data parameter description

Parameter	Type	Description
path	List	Shortest path. The format is as follows: [vertexId,...] where **vertexId** is of the string type.
source	String	Source vertex ID
target	String	Target vertex ID

4.1.6.2.14 n-Paths

Table 4-162 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
source	Yes	Source vertex ID of a path	String	-	-
target	Yes	Target vertex ID of a path	String	-	-
directed	No	Whether to consider the edge direction	Boolean	**true** or **false**	false
n	No	Number of paths	Integer	1 to 100	10
k	No	Number of hops	Integer	1 to 10	5

Table 4-163 response_data parameter description

Parameter	Type	Description
paths	List	Paths between the source vertex and target vertex. The format is as follows: [[path1],[path2]]
paths_number	Integer	Number of paths
source	String	Source vertex ID

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Parameter	Type	Description
target	String	Target vertex ID

4.1.6.2.15 Filtered n-Paths

Introduction

The filtered n-Paths algorithm is used to find no more than n k-hop loop-free paths between the source and target vertices. The start vertex (source), end vertex (target), number of hops (k), number of paths (n), and filter criteria (filters) are the parameters for the algorithm.

- Algorithm name: filtered_n_paths
- filtered_n_paths

Applicable Scope

Any network

Request Parameters

Table 4-164 Body format

Field	Mandatory	Type	Description
algorithmName	Yes	String	The value is **filtered_n_paths**.
parameters	Yes	JSON format	For details about the format, see **Table 4-165**.
filters	Yes	JSon Array	Filter criteria. Each element in the array corresponds to a filter. For details about the format, see **Table 4-166**.

Table 4-165 Parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
source	Yes	Source vertex	String	Internal vertices	None
target	Yes	Target vertex	String	Internal vertices	None

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Parameter	Mandatory	Description	Type	Value Range	Default Value
k	Yes	Number of hops	Int	[2,6]	2
n	Yes	Number of paths	Int	[1,1000]	1

Table 4-166 filters element format

Parameter	Mandatory	Type	Value Range	Default Value	Description
edge_filter	No	json	N/A	N/A	Filter criteria for full-graph edge query
vertex_filter	No	json	None	None	Filter criteria for full-graph vertex query

Table 4-167 response_data parameter description

Field	Mandatory	Type	Description
path_length	Yes	int	Path length
paths_number	Yes	int	Number of paths
paths	Yes	JsonArray	Path set. Example value: **["111","119","58","96","82","57","56"]**.
source	Yes	String	Source vertex
target	Yes	String	Target vertex

Example Request

```
POST http://IP:PORT/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-algorithm
{
   "algorithmName": "filtered_n_paths",
   "filters": [
   {
      "edge_filter":
      {
         "property_filter":
         {
            "leftvalue":
            {
               "label_name": "labelName"
```

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```
            },
            "predicate": "=",
            "rightvalue":
            {
                "value": "default"
            }
        }
    }
  }],
  "parameters":
  {
    "k": 6,
    "n": 100,
    "source": "111",
    "target": "56"
  }
}
```

Response

```
{
  "jobId": "b14f6380-f115-46ab-990e-9a76a984ebd2154236181",
  "jobType": 2
}
```

Example for Querying a Job

```
GET http://IP:PORT/ges/v1.0/{project_id}/graphs/{graph_name}/jobs/{jobId}/status
```

Query Result

```
{
  "data": {
    "outputs": {
      "data_return_size": 3,
      "paths": [
        [
          "111",
          "119",
          "58",
          "96",
          "82",
          "57",
          "56"
        ],
        [
          "111",
          "119",
          "58",
          "61",
          "76",
          "57",
          "56"
        ],
        [
          "111",
          "119",
          "58",
          "79",
          "76",
          "57",
          "56"
        ]
      ],
      "runtime": 0.000308,
      "source": "111",
      "path_length": 6,
      "data_offset": 0,
```

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```
            "paths_number": 3,
            "data_total_size": 3,
            "target": "56"
        }
    },
    "status": "success"
}
```

4.1.6.2.16 Filtered All Pairs Shortest Paths

Table 4-168 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
sources	Yes	Set of start vertex IDs. The value is in the standard CSV input format, that is, multiple vertex IDs are separated by commas (,).	String	The number of source vertices cannot exceed 10,000.	-
targets	Yes	Set of end vertex IDs. The value is in the standard CSV input format, that is, multiple vertex IDs are separated by commas (,).	String	The number of target vertices cannot exceed 10,000.	-
directed	No	Whether an edge is directed	Boolean	The value can be **true** or **false**.	false
cutoff	No	Maximum length	Integer	1-100	6

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Parameter	Mandatory	Description	Type	Value Range	Default Value
path_limit	No	Maximum number of paths	Integer	• For synchronous tasks: The value ranges from 1 to 100000. The default value is **100000**. • For asynchronous tasks: The value ranges from 1 to 1000000. The default value is **1000000**.	100000/1000000

NOTE

- Synchronous tasks: Number of source vertices x Number of target vertices x Maximum path length (**cutoff**) <= 1000000, Maximum number of paths (**path_num**) x Maximum path length (**cutoff**) <= 1000000.
- This algorithm checks memory capacity. When the memory is insufficient, the error "memory is not enough" is reported.

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Table 4-169 response_data parameter description

Parameter	Type	Description
batch_paths	List	Batch paths. Format: [paths_element,...] where **Paths_element** indicates the path from a source to a target. The format is as follows: { "paths": [["Alice", "Janet", "Sue", "Serena", "Bonnie"]], "source": "Alice", "target": "Bonnie" },
paths_number	Integer	Number of paths

4.1.6.2.17 All Shortest Paths of Vertex Sets

Table 4-170 Parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
sources	Yes	Source vertex ID set	String	The value is in the standard CSV format. IDs are separated by commas (,), for example, **Alice, Nana**. The maximum ID number is 100000.	-

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Parameter	Mandatory	Description	Type	Value Range	Default Value
targets	Yes	Target vertex ID set	String	The value is in the standard CSV format. IDs are separated by commas (,), for example, **Alice, Nana**. The maximum ID number is 100000.	-
directed	No	Whether to consider the edge direction	Boolean	**true** or **false**. It is a Boolean value.	false

Table 4-171 response_data parameter description

Parameter	Type	Description
paths	List	All shortest paths between the source vertex and target vertex. The format is as follows: [[path1],[path2]]
source	String	Source ID of a path
target	String	Target ID of a path

4.1.6.2.18 Filtered All Shortest Paths

Parameters

Table 4-172 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
source	Yes	Source vertex ID	String	- -	-
target	Yes	Target vertex ID	String	-	-
directed	No	Whether an edge is directed	Boolean	The value can be **true** or **false**.	false

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Table 4-173 response_data parameter description

Parameter	Type	Description
paths	List	Paths between the source and target vertices. The format is as follows: [[path1],[path2]] where For the format of each path, see **Shortest Path**.
paths_number	Integer	Number of paths
source	String	Source vertex ID
target	String	Target vertex ID

Example Request

```
POST    /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-algorithm
{
    "algorithmName": "filtered_all_shortest_paths",
    "edge_filter": {
        "property_filter": {
            "leftvalue": {
                "label_name": "labelName"
            },
            "predicate": "=",
            "rightvalue": {
                "value": "friends"
            }
        }
    },
    "parameters": {
        "source": "Alice",
        "target": "Jay",
        "directed": true
    }
}
```

Response

```
{
    "data": {
        "outputs": {
            "data_return_size": 8,
            "paths": [
                [
                    "Alice",
                    "Janet",
                    "Yvette",
                    "Willy",
                    "Jay"
                ],
                ...
                [
                    "Alice",
                    "Jacob",
                    "Jimmy",
                    "Cary",
                    "Jay"
                ]
            ],
```

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```
        "runtime": 0.005276,
        "source": "Alice",
        "data_offset": 0,
        "paths_number": 8,
        "data_total_size": 8,
        "target": "Jay"
      }
    }
}
```

Table 4-174 response_data parameter description

Parameter	Type	Description
paths	List	Paths between the source and target vertices. The format is as follows: [[path1],[path2]] where For the format of each path, see **Shortest Path**.
paths_number	Integer	Number of paths
source	String	Source vertex ID
target	String	Target vertex ID

4.1.6.2.19 Connected Component

NOTE

This algorithm can run without specifying its **parameters**.

Table 4-175 response_data parameter description

Parameter	Type	Description
Max_WCC_size	Integer	Maximum number of vertices in the largest connected component
Max_WCC_id	String	ID of the largest connected component
community	List	Connected component set (community) corresponding to each vertex, in **[{***vertexId***:***communityId***},...]** format. where **vertexId** is of the string type. **communityId** is of the string type.

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4.1.6.2.20 Label Propagation

Table 4-176 parameters parameter descriptions

Parameter	Mandatory	Description	Type	Value Range	Default Value
convergence	No	Convergence	Double	The value is a real number between 0 and 1.	0.00001
max_iterations	No	Maximum iterations	Integer	An integer ranging from 1 to 2147483647. For frontend calls, the range is [1,2000].	1000
initial	No	Name of the property used as the initialization label on a vertex	String	Empty or character string • Empty: Each vertex is allocated with a unique initialization label. This method is applicable to scenarios where no vertex label information exists. • Character string: The value of the property field corresponding to each vertex is used as the initialization label (the type is string, and the initialization label field is left blank for a vertex with unknown labels). This method is applicable to scenarios where some vertex labels are marked to predict unknown vertex labels. **NOTE** If the value of **initial** is a character string, the number of vertices with initialization labels must be greater than 0 and less than the total number of vertices.	-

NOTE

For details about algorithm iterations and convergence, see **Iterations and Convergence of PageRank**.

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Table 4-177 response_data parameter descriptions

Parameter	Type	Description
community	List	Community corresponding to each vertex. The format is as follows: [{vertexId:communityId},...] where **vertexId** is of the string type. **communityId** is of the string type.

4.1.6.2.21 Louvain

Table 4-178 parameters parameter descriptions

Parameter	Mandatory	Description	Type	Value Range	Default Value
convergence	No	Convergence	Double	The value is a real number between 0 and 1.	0.00001
max_iterations	No	Maximum iterations	Integer	An integer ranging from 1 to 2147483647. For frontend calls, the range is [1,2000].	100
weight	No	Weight of an edge	String	Empty or null character string • Empty: The default weight and distance of edges are **1**. • Character string: The property of the corresponding edge is the weight. If the edge does not have a property, the weight is **1** by default. **NOTE** The weight of an edge must be greater than **0**.	weight

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NOTE

For details about algorithm iterations and convergence, see **Iterations and Convergence of PageRank**.

Table 4-179 response_data parameter descriptions

Parameter	Type	Description
modularity	Double	Modularity
community_num	Integer	Number of communities
community	List	Community corresponding to each vertex. The format is as follows: [{vertexId:communityId},...] where **vertexId** is of the string type. **communityId** is of the string type.

4.1.6.2.22 Node2vec

Table 4-180 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
P	No	Rollback parameter	Double	Greater than 0	1
Q	No	Forward parameter	Double	Greater than 0	1
dim	No	Mapping dimension	Integer	An integer between 1 and 200 (including 1 and 200)	50
walkLength	No	Random walk length	Integer	An integer between 1 and 100 (including 1 and 100)	40
walkNumber	No	Number of random walk steps of each vertex.	Integer	An integer between 1 and 100 (including 1 and 100)	10

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Parameter	Mandatory	Description	Type	Value Range	Default Value
iterations	No	Number of iterations	Integer	An integer between 1 and 100 (including 1 and 100)	10

Table 4-181 response_data parameter description

Parameter	Type	Description
embedding	List	Vector representation of each vertex mapped to the Euclidean space. The format is as follows: [{vertexId:vectorValue}] where **vertexId** is of the string type. **vectorValue**: is a euclidean vector, for example, [-0.485, -0.679, 0.356].

4.1.6.2.23 Real-time Recommendation

Table 4-182 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
sources	Yes	Vertex ID. Multiple vertices are supported.	String	The number of source vertices cannot exceed the upper limit (30 by default, which can be changed using **source_limit**). Use commas (,) to separate the IDs.	-

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Parameter	Mandatory	Description	Type	Value Range	Default Value
alpha	No	Weight coefficient. A larger value indicates a longer step.	Double	A real number between 0 and 1 (excluding 0 and 1)	0.85
N	No	Total number of walk steps	Integer	1 to 200000	10000
nv	No	Parameter indicating that the walk process ends ahead of schedule: minimum number of access times of a potential recommended vertex **NOTE** If a vertex is accessed during random walk and the number of access times reaches **nv**, the vertex will be recorded as the potential recommended vertex.	Integer	1 to 10	5
np	No	Parameter indicating that the walk process ends ahead of schedule: number of potential recommended vertices **NOTE** If the number of potential recommended vertices of a source vertex reaches **np**, the random walk for the source vertex ends ahead of schedule.	Integer	1 to 2000	1000
label	No	Expected type of the vertex to be output. **NOTE** • Expected type of the vertex to be output. If the value is null, the original calculation result of the algorithm is output without considering the vertex type. • If the value is not null, vertices with the **label** are filtered from the calculation result.	String	Vertex label	-

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Parameter	Mandatory	Description	Type	Value Range	Default Value
directed	No	Whether to consider the edge direction	Boolean	true or false	true
source_limit	No	Maximum number of source vertices	Int	1~100000	30
restricted	No	Whether to accept invalid source vertices **restricted=true**: If a vertex that does not exist in the graph is passed to **sources**, an error is reported. **restricted=false**: A vertex that does not exist in the graph can be passed to **sources**. However, if all source vertices do not exist, an error is reported.	Bool	true or false	true

Table 4-183 response_data parameter description

Parameter	Type	Description
score	List	Score of each vertex, which reflects the recommendation degree. A larger value indicates a higher recommendation degree. The format is as follows: [{vertexId: scoreValue},...] where **vertexId** is of the string type. **scoreValue** is of the double type.
sources	List	ID of the source vertex

4.1.6.2.24 Degree Correlation

Table 4-184 response_data parameter description

Parameter	Type	Description
degree_correlation	Double	Degree correlation

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4.1.6.2.25 Triangle Count

Table 4-185 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range
statistics	No	Whether to export only the total statistical result. • **true**: Export only the statistical result. • **false**: Export the number of triangles corresponding to each vertex.	Boolean	**true** or **false**. The default value is **true**.

Table 4-186 response_data parameter description

Parameter	Type	Description
triangle_count	Integer	Number of triangles
vertex_triangles	List	Number of triangles on each vertex. The format is as follows: [{vertexId : vertexTriangleCount},...], where **vertexId** is of the string type. **vertexTriangleCount** is of the integer type.

4.1.6.2.26 Cluster Coefficient

Table 4-187 response_data parameter description

Parameter	Type	Description
cluster_coefficient	Double	Cluster coefficient

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4.1.6.2.27 Closeness Centrality

Table 4-188 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
source	Yes	ID of the vertex to be calculated	String	-	-

Table 4-189 response_data parameter description

Parameter	Type	Description
closeness	Double	Closeness centrality degree
source	String	Vertex ID to be calculated

4.1.6.2.28 Filtered Circle Detection

Request example

```
Post http://{}/ges/v1.0/1/graphs/movie/action?action_id=execute-algorithm
{
    "algorithmName": "filtered_circle_detection",
    "parameters": {
        "n": 10,
        "statistics": true,
        "output_format":"edgeId"
    },
    "filters": [
        {
        },
        {
            "operator": "out",
            "edge_filter": {
                "property_filter": {
                    "leftvalue": {
                        "label_name": "labelName"
                    },
                    "predicate": "=",
                    "rightvalue": {
                        "value": "transfer"
                    }
                }
            },
            "times":5
        }
    ]
}
```

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Parameters

Table 4-190 Parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
sources	No	Set of source vertex IDs to be queried	String	-	The value is in the standard CSV format. IDs are separated by commas (,), for example, **Alice, Nana**.
n	No	Upper limit of the number of enumerated circles that meet the filter criteria	Integer	[1,100000]	100
statistics	No	Whether to export the number of circles that meet the filter criteria	Boolean	**true** or **false**	false
batch_number	No	Number of source vertices for batch processing	Integer	[1,1000]	10
output_format	No	Output format	String	**vertexId**, **edgeId**, or **edgeObject**	edgeObject
filters	Yes	Filter criteria. Each element in the array corresponds to a filter.	Object	-	-

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Table 4-191 filters element formats

Parameter	Mandatory	Description	Type	Value Range	Default Value
operator	No	Direction of the query to be performed at the current layer	String	**out**, **in**, or **both**	out
edge_filter	No	Filter criteria for the current layer. For details, see **Table 4-274** in the **Filtered-query API**.	Object	-	-
vertex_filter	No	Filter criteria of vertices at the current layer. For details, see **Table 4-274** in the **Filtered-query API**.	Object	-	-
times	No	Number of layers queried using the same filter criteria	Integer	[1,10]	1

NOTE

- Filter criteria at the first layer are used to filter source vertices. Therefore, only the **vertex_filter** parameter is valid.
- Filter criteria at the last layer are used to filter source vertices.
- The circle length ranges from 3 to 10. Therefore, the number of filtering layers is 4 to 11.

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Table 4-192 response_data parameter description

Parameter	Mandatory	Type	Description
circles	Yes	List	Set of circles found. The format is **[[circle1], [circle2], ...]**. The **circle** format is as follows: • If **output_format** is **edgeObject**, the format is **[{"source": sourceId, "target": targetId, "index": edgeIndex}, ...]**, where **sourceId**, **targetId**, and **edgeIndex** are of the string type. • If **output_format** is **edgeId**, the format is **[sourceId-targetId-edgeIndex,...]**, where **sourceId-targetId-edgeIndex** is of the string type. • If **output_format** is **vertexId**, the format is **[vertexId, ...]**, where **vertexId** is of the string type.
runtime	Yes	Double	Algorithm running time
n	Yes	Integer	Maximum number of enumerated circles
circle_number	No	Integer	When **statistics** is set to **true**, the number of circles that meet filter criteria is displayed.

4.1.6.2.29 Subgraph Matching

Table 4-193 Parameter description

Parameter	Mandatory	Description	Type	Value Range
edges	Yes	Edge set of the subgraph to be matched. The vertex ID must be of the size_t type.	String	The value is in standard CSV format. The start and end vertices of an edge are separated by a comma (,), and edges are separated by a newline character (\n). For example, **1,2\n2,3**.

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Parameter	Mandatory	Description	Type	Value Range
vertices	Yes	Label of each vertex on the subgraph to be matched.	String	The value is in standard CSV format. Vertices and their labels are separated by commas (,), and labels are separated by newline characters (\n). For example, **1,BP\n2,FBP\n3,CP**.
directed	No	Whether to consider the direction of the graph	Boolean	The value can be **true** or **false**. The default value is **true**.
n	No	Maximum number of subgraphs to be searched for	Integer	The value range is [1,100000]. The default value is **100**.
batch_number	No	Number of queries processed in batches each time	Integer	The value range is [1,1000000]. The default value is **10000**.
statistics	No	Whether to display the number of all subgraphs that meet the conditions	Boolean	The value can be **true** or **false**. The default value is **false**.

Table 4-194 response_data parameter description

Parameter	Mandatory	Type	Description
subgraphs	Yes	List	Subgraphs with the same pattern of the **pattern_graph**. The value is in the [[subgraph1],[subgraph2], ...] format. Each subgraph is in the [vertex1,vertex2, ...] format, where **vertex** is of the string type. The vertices of each subgraph correspond to those of **pattern_graph**.
pattern_graph	Yes	List	Graph pattern. The value is in the [vertex1,vertex2, ...] format, where vertex is of the string type.
subgraph_number	No	Integer	Number of matched graphs. When **statistics** is set to **true**, the total number of graphs that meet query conditions is displayed.

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4.1.6.2.30 Topicrank

Table 4-195 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
sources	Yes	Vertex ID. You can specify multiple node IDs in CSV format and separate them with commas (,).	String	Currently, a maximum of 100000 IDs are allowed.	-
actived_p	No	Initial weight of the sources vertex.	Double	The value ranges from 0 to 100000.	1
default_p	No	Initial weight of a non-source vertex	Double	The value ranges from 0 to 100000.	1
filtered	No	Whether to filter results	Boolean	The value can be **true** or **false**.	false
only_neighbors	No	Whether to display only the neighboring vertices of the sources	Boolean	The value can be **true** or **false**.	false
alpha	No	Weight coefficient	String	The value is a real number between 0 and 1.	0.85
convergence	No	Convergence	String	The value is a real number between 0 and 1.	0.00001
max_iterations	No	Maximum iterations	Integer	An integer ranging from 1 to 2147483647. For frontend calls, the range is [1,2000].	1000
directed	No	Whether the edges are directed	Boolean	The value can be **true** or **false**.	true

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Parameter	Mandatory	Description	Type	Value Range	Default Value
num_thread	No	Number of threads	Integer	The value ranges from 1 to 40.	4

Table 4-196 response_data parameter description

Parameter	Type	Description
topicrank	List	TopicRank value of each vertex. The format is as follows: [{vertexId:rankValue},...], where **vertexId** is of the string type. **rankValue** is of the double type.

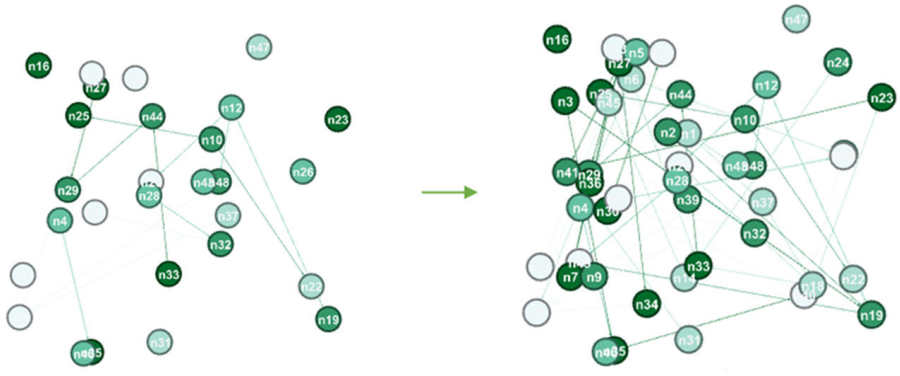
4.1.7 Temporal Graph APIs

4.1.7.1 Community Evolution (temporal_graph)

Function

The community evolution algorithm generates a temporal graph that shows structure changes of a community over time.

Figure 4-1 Principle



URL

POST /ges/v1.0/{project_id}/graphs/{graph_name}/dynamicgraphs/action?action_id=execute-analysis

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Table 4-197 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-198 Request body parameters

Parameter	Mandatory	Type	Description
algorithmName	Yes	String	Algorithm name
dynamicRange	Yes	Object	Temporal parameters
parameters	Yes	String	Algorithm parameters

Table 4-199 dynamicRange parameters

Parameter	Mandatory	Type	Description
start	Yes	Date or integer	Start time of the temporal analysis. The start time must be earlier than the end time.
end	Yes	Date or integer	End time of the temporal analysis
time_props	Yes	Object	Time properties for the temporal analysis

Table 4-200 time_props parameters

Parameter	Mandatory	Type	Description
stime	Yes	String	Property name of the start time
etime	Yes	String	Property name of the end time

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Table 4-201 parameters parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Vertices in the community network. You can specify a maximum of 100,000 vertices.

Response Parameters

Table 4-202 Parameters in a response

Parameter	Mandatory	Type	Description
errorMessage	No	String	System prompt. If execution succeeds, this parameter may be left blank. If execution fails, this parameter is used to display the error message.
errorCode	No	String	System prompt. If execution succeeds, this parameter may be left blank. If execution fails, this parameter is used to display the error code.
status	No	String	Returned job status for a successful query. Possible values are **waiting**, **running**, and **complete**. This parameter is left blank when the query fails.
data	No	Json	Algorithm execution result. This parameter is left blank when the query fails.

Example Request

Observe the community evolution of some nodes. The algorithm name is **temporal_graph**, the start time of dynamic analysis is **${startTime}**, and the end time is **${endTime}**.

```
POST  http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/dynamicgraphs/action?
action_id=execute-analysis
{
  "algorithmName":"temporal_graph",
  "dynamicRange":{
    "start":"${startTime}",
    "end":"${endTime}",
    "time_props":{"stime":"${property(start_time)}","etime":"${property(start_time)}"}
  },
  "parameters":{
        "sources":[]
```

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```
  }
}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "jobId": "f9987cab-64d3-4b3d-ac43-e91ae0c21bef168127124",
  "jobType": 0
}
```

Status code: 400

Example response for a failed request

```
{
"errorMessage":"${errorMessage}",
"errorCode":"GES.8301"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error
401 Unauthorized	Authorization failed
403 Forbidden	No operation permissions
404 Not Found	No resources found
500 Internal Server Error	Internal server error
503 Service Unavailable	Service unavailable

4.1.7.2 Temporal BFS (temporal_bfs)

Function

This algorithm searches for associated vertices based on temporal message passing and temporal BFS algorithms, and outputs the visit time of each vertex and the distance from the vertex to the source start vertex.

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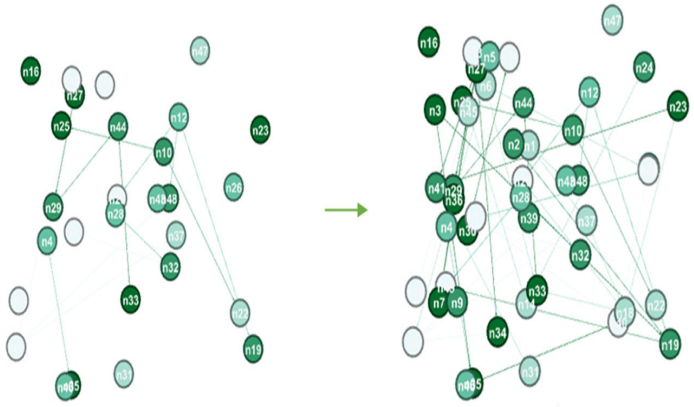
Figure 4-2 Principle



URL

POST /ges/v1.0/{project_id}/graphs/{graph_name}/dynamicgraphs/action?action_id=execute-analysis

Table 4-203 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-204 Request body parameters

Parameter	Mandatory	Type	Description
algorithmName	Yes	String	Algorithm name
dynamicRange	Yes	String	Temporal parameters
parameters	Yes	String	Algorithm parameters

Table 4-205 dynamicRange parameters

Parameter	Mandatory	Type	Description
start	Yes	Date or integer	Start time of the temporal analysis

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Parameter	Mandatory	Type	Description
end	Yes	Date or integer	End time of the temporal analysis
time_props	Yes	Object	Time properties for the temporal analysis

Table 4-206 time_props parameters

Parameter	Mandatory	Type	Description
stime	Yes	String	Property name of the start time
etime	Yes	String	Property name of the end time

Table 4-207 parameters parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Start vertex ID
k	No	Integer	Distance from the target vertices to the start vertex. The value range is [1, 100] and the default value is **3**.
directed	No	Boolean	Search direction. The value can be **true** or **false**. The default value is **true**.

Response Parameters

Table 4-208 Parameters in a response

Parameter	Mandatory	Type	Description
errorMessage	No	String	System prompt. If execution succeeds, this parameter may be left blank. If execution fails, this parameter is used to display the error message.
errorCode	No	String	System prompt. If execution succeeds, this parameter may be left blank. If execution fails, this parameter is used to display the error code.

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Parameter	Mandatory	Type	Description
status	No	String	Returned job status for a successful query. Possible values are **waiting**, **running**, and **complete**. This parameter is left blank when the query fails.
data	No	Json	Algorithm execution result. This parameter is left blank when the query fails.

Example Request

Specify a source vertex ID to search for associated vertices. The algorithm name is **temporal_bfs**, the start time of dynamic analysis is **${startTime}**, and the end time is **${endTime}**.

```
POST  http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/dynamicgraphs/action?
action_id=execute-analysis
{
  "algorithmName":"temporal_bfs",
  "dynamicRange":{
    "start":"${startTime}",
    "end":"${endTime}",
    "time_props":{"stime":"${property(start_time)}","etime":"${property(start_time)}"}
  },
  "parameters":{
        "source":"",
  }
}
```

Example Response

Status code: 200

Example response for a successful request

```
{
  "jobId": "f9987cab-64d3-4b3d-ac43-e91ae0c21bef168127124",
  "jobType": 0
}
```

Status code: 400

Example response for a failed request

```
{
"errorMessage":"${errorMessage}",
"errorCode":"GES.8301"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error

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Return Value	Description
401 Unauthorized	Authorization failed
403 Forbidden	No operation permissions
404 Not Found	No resources found
500 Internal Server Error	Internal server error
503 Service Unavailable	Service unavailable

4.1.8 Path APIs

4.1.8.1 Querying Path Details

Function

This API is used to query the path details. All possible paths will be listed.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/paths/action?action_id=query-detail

Table 4-209 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Example Request

Query path details. The paths to be queried are **Ray**, **Lethal Weapon**, and **Alice**. Do not set the query direction.

```
post http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/paths/action?action_id=query-detail
{
   "paths":[
      [
         "Ray",
         "Lethal Weapon",
         "Alice"
      ]
   ],
```

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```
    "directed":false
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Request Parameters

Table 4-210 Request body parameters

Parameter	Mandatory	Type	Description
paths	Yes	List	Set of paths to be queried
directed	No	Boolean	Whether the querying path is directional or non-directional: **true**: directional **false**: non-directional default=false

Response Parameters

Table 4-211 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Query results. This parameter is left blank when the query fails.

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Table 4-212 data parameter description

Parameter	Type	Description
outputs	Object	Query results containing the paths
paths	List	Collection of paths that contain detailed vertex and edge information, in JSONArray format **NOTE** In the returned paths: • If the vertex does not exist, the corresponding position is {}. • If there is no edge between vertices, the corresponding position is {"edges": []}.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
   "data": {
      "outputs":{
            "paths":[
               [
                  {
                     "id":"Ray",
                     "label":"user",
                     "properties":{
                        "Name":["Ray"],
                        "Gender":["M"],
                        "Age":["18-24"],
                        "Occupation":["college/grad student"],
                        "Zip-code":["90241"]
                     }
                  },
                  {
                     "edges":[
                        {
                           "source":"Ray",
                           "target":"Lethal Weapon",
                           "index":"1",
                           "label":"rate",
                           "properties":{
                              "Score":[2],
                              "Datetime":["2000-11-22 19:16:16"]
                           }
                        }
                     ]
                  },
                  {
                     "id":"Alice",
                     "label":"user",
                     "properties":{
                        "Name":["Alice"],
                        "Gender":["F"],
                        "Age":["25-34"],
                        "Occupation":["academic/educator"],
                        "Zip-code":["79928"]
```

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```
                }
            }
        ]
    ]
  }
 }
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
"errorMessage":"graph [demo] is not found",
"errorCode":"GES.8107"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.9 Graph Statistics APIs

4.1.9.1 Querying General Information About a Graph

Function

This API is used to query the general information about a graph, such as the numbers of vertices and edges.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/summary?label_details={labelDetails}

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Table 4-213 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
labelDetails	No	Boolean	Whether to return the number of vertices and edges under each label. The default value is **false**. If this parameter is set to **true**, the numbers of vertices and edges under each label are returned.

Request Parameters

None

Response Parameters

Table 4-214 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Query results. This parameter is left blank when the request fails.

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Table 4-215 data parameter description

Parameter	Type	Description
vertexNum	Integer	Number of vertices in a graph
edgeNum	Integer	Number of edges in a graph
labelDetails	Object	Numbers of vertices and edges under each label. To properly display this parameter, create vertex and edge indexes based on **Table 4-216**.

Table 4-216 Description of each element in **labelDetails** when the execution is successful

Parameter	Type	Description
labelInVertex	Object	Number of vertices under each label. If the number of vertices under a label is 0, the label is not displayed. To include this parameter in the response, create an index by referring to **Creating an Index**. During index creation, set **indexType** to **GlobalComposite-VertexIndex**, set **hasLabel** to **true**, and leave **indexProperty** blank.
labelInEdge	Object	Number of edges under different labels. If the number of edges under a label is 0, the label is not displayed. To include this parameter in the response, create an index by referring to **Creating an Index**. During index creation, set **indexType** to **GlobalCompositeEdgeIndex**, set **hasLabel** to **true**, and leave **indexProperty** blank.
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.

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Example Request

Query general information about a graph, such as the numbers of vertices and edges. The value **true** indicates that the numbers of vertices and edges of different labels are returned.

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/summary?label_details=true
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

- Response example 1 of a successful request (The numbers of vertices and edges under each label are returned.)

```
Http Status Code: 200
{
    "data": {
        "vertexNum": 146,
        "labelDetails": {
            "labelInVertex": {
                "movie": 46,
                "user": 100
            },
            "labelInEdge": {
                "default": 450,
                "rate": 1209
            }
        },
        "edgeNum": 1659
    }
}
```

- Response example 2 of a successful request (The numbers of vertices and edges under each label fail to be returned.)

```
Http Status Code: 200
{
    "data": {
        "vertexNum": 146,
        "labelDetails": {
            "errorMessage": "Label index in vertices is not found.Label index in edges is not found.",
            "errorCode": "GES.8017"
        },
        "edgeNum": 1659
    }
}
```

- Example response 3 of a successful request (Only the number of vertices under each label is returned.)

```
Http Status Code: 200
{
    "data": {
        "vertexNum": 146,
        "labelDetails": {
            "errorMessage": "Label index in edges is not found.",
            "labelInVertex": {
                "movie": 46,
                "user": 100
            },
            "errorCode": "GES.8017"
        },
        "edgeNum": 1659
```

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```
    }
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
    "errorMessage": "graph [demo] is not found",
    "errorCode": "GES.8001"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.9.2 Querying the Graph Version

Function

This API is used to query the graph version.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/version

Table 4-217 URI parameter description

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Request Parameters

None

Response Parameters

Table 4-218 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
version	String	Query results. This parameter is left blank when the request fails.

Example Request

Query the graph version.

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/version
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response (successful request)

```
Http Status Code: 200
{
    "version":"2.0.0"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 404
{
  "errorMessage":"Not found. Please check the input parameters.",
  "errorCode": "GES.8000"
}
```

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Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.10 Graph Operation APIs

4.1.10.1 Importing a Graph

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=import-graph

Table 4-219 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-220 Request body parameters

Parameter	Mandatory	Type	Description
edgesetPath	No	String	Edge file directory or name

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Parameter	Mandatory	Type	Description
edgesetFormat	No	String	Format of the edge data set. Currently, only the CSV format is supported. The CSV format is used by default.
vertexsetPath	No	String	Vertex file directory or name
vertexsetFormat	No	String	Format of the vertex data set. Currently, only the CSV format is supported. The CSV format is used by default.
schemaPath	No	String	OBS path of the metadata file of the new data
logDir	No	String	Directory for storing logs of imported graphs. This directory stores the data that fails to be imported during graph creation and detailed error causes.
parallelEdge	No	Object	How to process repetitive edges.
action	No	String	Processing mode of repetitive edges. The value can be **allow**, **ignore**, or **override**. The default value is **allow**. • **allow** indicates that repetitive edges are allowed. • **ignore** indicates that subsequent repetitive edges are ignored. • **override** indicates that the previous repetitive edges are overwritten.

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Parameter	Mandatory	Type	Description
ignoreLabel	No	Boolean	Whether to ignore labels on repetitive edges. The value is **true** or **false**, and the default value is **true**. • **true**: Indicates that the repetitive edge definition does not contain the label. That is, the <source vertex, target vertex> indicates an edge, excluding the label information. • **false**: Indicates that the repetitive edge definition contains the label. That is, the <source vertex, target vertex, label> indicates an edge.
delimiter	No	Character	Field separator in a CSV file. The default value is comma (,). The default element separator in a field of the list/set type is semicolon (;).
trimQuote	No	Character	Field quote character in a CSV file. The default value is double quotation marks ("). They are used to enclose a field if the field contains separators or line breaks.
offline	No	Boolean	Whether offline import is selected. The value is **true** or **false**, and the default value is **false**. • **true**: Offline import is selected. The import speed is high, but the graph is locked and cannot be read or written during the import. • **false**: Online import is selected. Compared with offline import, online import is slower. However, the graph can be read (cannot be written) during the import.
obsParameters	Yes	Object	OBS parameters

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Table 4-221 obsParameters parameters

Parameter	Mandatory	Type	Description
accessKey	Yes	String	User AK
secretKey	Yes	String	User SK

Response Parameters

Table 4-222 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of an asynchronous job You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.

Example Request

Import a graph. The edge file directory is **testbucket/demo_movie/edges/** and the edge data set format is CSV; the vertex file directory is **testbucket/demo_movie/vertices/** and the vertex data set format is CSV; the OBS path of the metadata file of the new data is **testbucket/demo_movie/incremental_data_schema.xml** and the log storage directory is **testbucket/importlogdir**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=import-graph
{
  "edgesetPath": "testbucket/demo_movie/edges/",
  "edgesetFormat": "csv",
  "vertexsetPath": "testbucket/demo_movie/vertices/",
  "vertexsetFormat": "csv",
  "schemaPath": "testbucket/demo_movie/incremental_data_schema.xml",
  "logDir": "testbucket/importlogdir",
  "parallelEdge": {
        "action":"override",
        "ignoreLabel":true
```

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```
 },
 "delimiter": ",",
 "trimQuote": "\"",
 "offline": true,
 "obsParameters": {
   "accessKey": "xxxxxx",
   "secretKey": "xxxxxx"
 }

}
```

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"jobId": "b4f2e9a0-0439-4edd-a3ad-199bb523b613"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorCode": "GES.8013",
  "errorMessage": "graph [movie2] is not found"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.10.2 Exporting a Graph

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=export-graph

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Table 4-223 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-224 Request body parameters

Parameter	Mandatory	Type	Description
graphExportPath	Yes	String	OBS path to which a graph is exported
edgeSetName	Yes	String	Name of the exported edge data set
vertexSetName	Yes	String	Name of the exported vertex data set
schemaName	Yes	String	Name of the exported metadata file
obsParameters	Yes	String	OBS parameters
accessKey	Yes	String	User AK
secretKey	Yes	String	User SK

Response Parameters

Table 4-225 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.

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Parameter	Type	Description
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of an asynchronous job You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.

Example Request

- Example request 2

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=export-graph
{
  "graphExportPath": "demo_movie/",
  "edgeSetName": "set_edge.csv",
  "vertexSetName": "set_vertex.csv",
  "schemaName": "set_schema.xml",
  "obsParameters": {
    "accessKey": "xxxxxx",
    "secretKey": "xxxxxx"
  }
}
```

Example Response

Status code: 200

Example response (successful request)

```
Http Status Code: 200
{
"jobId": "b4f2e9a0-0439-4edd-a3ad-199bb523b613"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
   "errorCode": "GES.8011",
   "errorMessage": "graph [movie2] is not found"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.

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Return Value	Description
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.10.3 Clearing a Graph

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=clear-graph

Table 4-226 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-227 Request body parameter

Parameter	Mandatory	Type	Description
clearMetadata	No	Boolean	Whether to clear schema data. The default value is **false**.

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Response Parameters

Table 4-228 Response body parameters

Parameter	Mandatory	Description
errorMessage	No	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	No	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	No	ID of an asynchronous job You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.

Example Request

Clear a graph by deleting its schema data.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=clear-graph
{
        "clearMetadata": true
}
```

Example Response

Status code: 200

Example response (successful request)

```
Http Status Code: 200
{
"jobId": "b4f2e9a0-0439-4edd-a3ad-199bb523b613"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorCode": "GES.8012",
  "errorMessage": "graph [movie2] is not found"
}
```

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Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.11 Subgraph Operation APIs

4.1.11.1 Querying a Subgraph

Function

This API is used to query the subgraphs formed by the entered vertices and edges between the vertices.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/subgraphs/action?action_id=query

Table 4-229 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Request Parameters

Table 4-230 Request body parameter

Parameter	Mandatory	Type	Description
vertices	Yes	String	Vertex ID array of the subgraph **NOTE** The maximum number of vertices that can be entered is 100,000. If the number of vertices exceeds this limit, an error is reported.

Response Parameters

Table 4-231 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	The **data** field is contained when the query is successful, and the **data** field contains the subgraph query result. **NOTE** The maximum number of subgraph edges that can be returned is 100,000. If the number of edges exceeds this limit, an error is reported.

Example Request

Query the subgraphs formed by the entered vertices and edges between the vertices. The subgraph vertex IDs are **Ray**, **Ella**, and **Lethal Weapon**.

```
{
   "vertices":[
            "Ray",
            "Ella",
            "Lethal Weapon"
            ]
}
```

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Example Response

Status code: 200

Example response (successful request)


```
Http Status Code: 200
{
   "data":{
      "vertices":[
         {
            "id":"Ray",
            "label":"user",
            "properties":{
               "Name": ["Ray"],
               "Gender":["M"],
               "Age":["18-24"],
               "Occupation":["college/grad student"],
               "Zip-code":["90241"]
            }
         },
         {
            "id":"Ella",
            "label":"user",
            "properties":{
               "Occupation":["other or not specified"],
               "Name": ["Era"],
               "Zip-code":["94402"],
               "Gender":["F"],
               "Age":["25-34"]
            }
         }
      ],
      "edges":[
         {
            "source":"Ray",
            "target":"Lethal Weapon",
            "index":"1",
            "label":"rate",
            "properties":{
               "Score":[2],
               "Datetime":["2000-11-22 19:16:16"]
            }
         },
         {
            "index":"0",
            "source":"Ella",
            "label":"rate",
            "properties":{
               "Score":[5],
               "Datetime":["2000-11-23 02:30:29"]
            },
            "target":"Lethal Weapon"
         },
         {
            "index":"5",
            "source":"Ella",
            "label":"friends",
            "properties":{},
            "target":"Ray"
         }
      ]
   }
}
```


Status code: 400

Example response for a failed request

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```
Http Status Code: 400
{
  "errorMessage": " Bad Request, parameter vertices cannot be null",
  "errorCode": "GES.8214"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.11.2 Executing an Algorithm on a Subgraph

Introduction

This API is used to adjust the subgraph creation type based on the input and executes an algorithm on the generated subgraph.

URL

POST /ges/v1.0/{project_id}/graphs/{graph_name}/subgraphs/action?action_id=execute-algorithm

Parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Request Parameters

Table 4-232 Request body parameters

Parameter	Mandatory	Type	Description
algorithmName	Yes	String	Algorithm name Available values are as follows: • connected_component • kcore
parameters	Yes	JSON	Algorithm parameters • **connected_component** • **Kcore**
subgraphCreator	Yes	Object	Subgraph parameters For details, see **subgraphCreator parameters**.

Table 4-233 subgraphCreator parameters

Parameter	Mandatory	Type	Description
name	No	String	Type of the subgraph creator. Currently, only **filtered** is available.
parameters	Yes	JSON	The parameter format varies according to the name of the subgraph creator.

Table 4-234 Parameters when **name=filtered**

Parameter	Mandatory	Type	Description
vertex_filter	No	String	Vertex filtering criteria
edge_filter	No	String	Edge filtering criteria

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Response Parameters

Table 4-235 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of the algorithm execution job. This parameter is left blank when the request fails. **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.
jobType	Integer	Job type. This parameter is left blank when the request fails.

Example Request

Execute a specific algorithm on a generated subgraph. The algorithm name is **connected_component**, and the subgraph generator type is **filtered**.

```
POST  http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/subgraphs/action?
action_id=execute-algorithm
 {
  "algorithmName":"connected_component",
"subgraphCreator": {
        "name": "filtered",
        "parameters": {
            "edge_filter": {
                "property_filter": {
                    "leftvalue": {
                        "label_name": "labelName"
                    },
                    "predicate": "=",
                    "rightvalue": {
                        "value": "PHYSICAL_LINK"
                    }
                }
            }
        }
    },
 "parameters":{
        "num_thread":4
 }
}
```

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Example Response

Status code: 200

Example response (successful request)

```
Http Status Code: 200
{
"jobId": "4448c9fb-0b16-4a78-8d89-2a137c53454a001679122",
"jobType": 1
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
"errorMessage":"graph [demo] is not found",
"errorCode":"GES.8402"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.12 Job Management APIs

4.1.12.1 Querying Job Status on the Service Plane

Function

This API is used to query the execution status of a job. After asynchronous APIs such as those for querying vertices and edges or executing algorithms are used, job IDs are returned. You can use the job ID to query the execution status of a job.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/jobs/{job_id}/status?offset=*offset*&limit=*limit*

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Table 4-236 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
job_id	Yes	String	Job ID
offset	No	Integer	Offset of a query. The default value is **0**.
limit	No	Integer	Maximum number of records that can be queried. The default value is **100000**.

Response Parameters

Table 4-237 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
status	String	Returned job status after the query is successful. Possible values: • **pending** • **running** • **success** • **failed** This parameter is left blank when the query fails.
data	Object	Algorithm execution result. This parameter is left blank when the query fails.

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Table 4-238 data parameter description

Parameter	Type	Description
vertices	List	Vertex-associated algorithm result
edges	List	Edge-associated algorithm result
outputs	Object	Other results
data_return_size	Integer	Number of records returned after a query
data_offset	Integer	Result offset of a query
data_total_size	Integer	Total amount of result data generated by asynchronous jobs

Example Request

Query the execution status of a job. The query offset is **0**, and the maximum number of returned results is **2**.

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/jobs/{job_id}/status?offset=0&limit=2
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response (successful request)

```
Http Status Code: 200
{
    "data": {
        "outputs": {
            "data_return_size": 2,
            "vertices": [
                {
                    "id": "Sarah",
                    "label": "user",
                    "properties": {
                        "Occupation": [
                            "other or not specified"
                        ],
                        "Name": [
                            "Sarah"
                        ],
                        "Zip-code": [
                            "55105"
                        ],
                        "Gender": [
                            "F"
                        ],
                        "Age": [
                            "18-24"
                        ]
                    }
```

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```
            },
            {
                "id": "Sidney",
                "label": "user",
                "properties": {
                    "Occupation": [
                        "writer"
                    ],
                    "Name": [
                        "Sidney"
                    ],
                    "Zip-code": [
                        "85296"
                    ],
                    "Gender": [
                        "M"
                    ],
                    "Age": [
                        "18-24"
                    ]
                }
            }
        ],
        "data_offset": 0,
        "data_total_size": 19
    }
  },
  "status": "success"
}
```


Status code: 400

Example response for a failed request


```
Http Status Code: 400
{
"errorMessage":"graph [demo] is not found",
"errorCode":"GES.8402"
}
```


Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

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4.1.12.2 Canceling a Job

Function

This API is used to cancel a job that has been submitted.

NOTE

Only jobs returned by the following APIs can be canceled: exporting a graph, importing a graph, querying vertices that meet filter criteria, querying edges that meet filter criteria, edge filtering query, **Filtered-query V2**, executing an algorithm, and adding an index.

URI

DELETE /ges/v1.0/{project_id}/graphs/{graph_name}/jobs/{job_id}

Table 4-239 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
job_id	Yes	String	Job ID
graph_name	Yes	String	Graph name

Request Parameters

For details, see the URI parameters.

Response Parameters

Table 4-240 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.

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Parameter	Type	Description
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.

Example Request

Cancel a job that has been submitted.

```
DELETE http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/jobs/{job_id}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response (successful request)

```
Http Status Code: 200
{ }
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{

"errorMessage": "can not find job to cancel, id is 9440a7ebXXXXXXXXXXXXXXXXXXXX2d079a67001679122",

"errorCode": "GES.8303"
}
```

Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

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Error Code

See **Error Code**.

4.1.12.3 Exporting Job Execution Results to Files

Function

This API is used to export the execution result (**result**) of an asynchronous job (**jobId**) to a file.

- The following algorithms are supported:
  - PageRank, PersonalRank, and Pixie
  - Louvain, Label Propagation, and Connected Component
  - K-Core
  - SSSP, Shortest Path (including Time Window Shortest Path), Shortest Path of Vertex Sets, All Shortest Paths, and n Paths
  - Triangle Count, Cluster Coefficient, Degree Correlation, and Closeness
  - Link Prediction
  - Betweenness, edge_betweenness, and od_betweenness
- The following queries are supported:
  - **Cypher Queries (2.2.16)**

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/jobs/{job_id}/action?action_id=export-result

Table 4-241 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
job_id	Yes	String	ID of the job corresponding to the response

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Request Parameters

Table 4-242 Request body parameters

Parameter	Mandatory	Type	Description
exportPath	Yes	String	Export path
fileName	No	String	Name of the exported file
obsParameters	Yes	String	OBS authentication parameters. For details, see **Table 4-243**.

Table 4-243 obsParameters parameter description

Parameter	Mandatory	Type	Description
accessKey	Yes	string	AK value
secretKey	Yes	string	SK value

Response Parameters

Table 4-244 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of an asynchronous job. You can view the job execution status and obtain the return result by querying the job ID. For details, see **Querying Job Status on the Service Plane (1.0.0)**.

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Example Request

Export the execution results of an asynchronous job to an OBS file. The export path is **demo_movie/**, and the exported file name is **louvain**. After the export, the original job is deleted.

```
POST /ges/v1.0/{project_id}/graphs/{graph_name}/jobs/{job_id}/action?action_id=export-result
{
    "exportPath": "demo_movie/",
    "fileName": "louvain",
    "obsParameters": {
        "accessKey": "xxxx",
        "secretKey": "xxxx"
    }
}
```

Example Response

Status code: 200

Example response (successful request)

```
HttpStatusCode: 200
{
    "jobId": "f99f60f1-bba6-4cde-bd1a-ff4bdd1fd500000168232"
}
```

Status code: 400

Example response for a failed request

```
HttpStatusCode: 400
{
    "errorMessage": "graph [demo] is not found",
    "errorCode": "GES.8011"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

Exporting the Result in CSV File

1. The following is an example of the algorithm execution result, for example, content of **Louvain.csv**:

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```
# modularity: 0.4269691347613425,
#community_num: 4,
#runtime: 0.003784,
#data_total_size: 34
#community:
1,1
2,1
...
```

2. The following is an example Cypher query result:
   - Example 1

     Query statement:

     ```
     match (n:user)-[r]->(m:movie) return id(n),n.Name, n.Occupation, n.Age,r.Score,m.Title
     ```

     Result:

     ```
     #data_total_size:1209
     #data_return_size:1209
     #data_offset:0
     #records:
     Vivian, artist, 25-34, 5, Lethal Weapon
     Vivian, Artist, 25-34, 4, Raising Arizona
     Mercedes, K-12 student, Under 18, 3, Lethal Weapon
     Mercedes, K-12 student, Under 18, 3, The Rock
     ...
     ```

   - Example 2

     Query statement:

     ```
     match (n)-->(m) where id(n)='Vivian' return labels(m),count(*)
     ```

     Result:

     ```
     #data_total_size:2
     #data_return_size:2
     #data_offset:0
     #records:
     user,5
     movie,2
     ```

4.1.12.4 Querying the Job List

Function

After the ID of an asynchronous job is returned, if the job ID at the service layer is lost and cannot be obtained through the API, a new API is provided to query all asynchronous jobs stored in the engine. The job ID, job status, and original request of each job are returned.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/jobs/status?limit={limit}&offset={offset}

Table 4-245 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

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Parameter	Mandatory	Type	Description
offset	No	Integer	Offset of a query. The default value is **0**.
job_id	Yes	String	ID of the job corresponding to the response
limit	No	Integer	Maximum number of records that can be queried. The default value is **100000**.

Request Parameters

For details, see the URI parameters.

Response Parameters

Table 4-246 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Query result. If the query is successful, the value is **success**. If the query fails, the value is **failed**.
jobs	Object	Job status list stored in the system. If execution succeeds, this parameter is contained in the response. **Table 4-247** describes the structure of a single jobs field.

Table 4-247 Job status structure

Parameter	Type	Description
jobId	String	Job name.
request	Object	Request content, including the command, URL, and body.

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Parameter	Type	Description
status	String	Job status. The value can be **pending**, **running**, or **complete**.

Example Request

Query the job list and return the job ID and status of each job.

```
GET /ges/v1.0/{project_id}/graphs/movie/jobs/status?limit=2&offset=0
```

Example Response

Status code: 200

Example response for a successful request

```
{
   "jobs": [
      {
         "jobId": "625821631239919436 83d0f9aa3-f701-48be-a662-360e6a0455da",
         "status": "complete",
         "request": {
            "command": "import_graph",
            "url": "/ges/v1.0/10001/graphs/moviejx/action?action_id=import-graph",
            "body": {
               "edgesetPath": "file:///root/ges-install/auDatas/ranking_edge-sp.csv",
               "vertexsetPath": "file:///root/ges-install/auDatas/movies_vertex_new.csv",
               "schemaPath": "file:///root/ges-install/auDatas/schema_aikv.xml.bak"
            }
         }
      },
      {
         "jobId": "625821631239919436 83fe74caf-f4d3-48b3-b3ee-66daaedcd2ca",
         "status": "complete",
         "request": {
            "command": "import_graph",
            "url": "/ges/v1.0/10001/graphs/moviejx/action?action_id=import-graph",
            "body": {
               "edgesetPath": "file:///root/ges-install/auDatas/ranking_edge-sp.csv",
               "vertexsetPath": "file:///root/ges-install/auDatas/movies_vertex_new.csv",
               "schemaPath": "file:///root/ges-install/auDatas/schema_aikv.xml.bak"
            }
         }
      }
   ],
   "result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
 {
    "errorMessage": "graph : movidde not exist",
   "errorCode": "GES.8000",
   "result": "failed"
}
```

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Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.13 Custom Operations APIs

4.1.13.1 Performing Custom Operations

Function

This API is used to perform a specified custom operation.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-operation

Table 4-248 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Request Parameters

Table 4-249 Request body parameters

Parameter	Mandatory	Type	Description
api	Yes	String	Available APIs used by the custom operation.
command	Yes	String	Command executed by the custom operation.

Response Parameters

Table 4-250 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	json	Execution result of the custom operation. This parameter is left blank when the request fails.

Example Request

Perform a specified custom operation. The API used for the custom operation is **gremlin**, and the command is **{\"command\": \"g.V('1')\"}**.

```
POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-operation
{
    "api": "gremlin",
    "command": "{\"command\": \"g.V('1')\"}"
}
```

Example Response

Status code: 200

Example response (successful request)

```
{
    "data":{
```

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```
        "vertices":[
            {
                "id":"1",
                "label":"movie",
                "properties":{
                    "genres":[
                        "Comedy"
                    ],
                    "movieid":[
                        1
                    ],
                    "title":[
                        "Airplane! (1980)"
                    ]
                }
            }
        ],
        "runtime":0.126476598
    }
}
```


Status code: 400

Example response for a failed request


```
Internal Server Error
{
    "errorCode":"GES.8814",
    "errorMessage":"Unsupported API."
}
```


Status Code

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.1.14 Cypher Queries

4.1.14.1 Executing Cypher Queries

Function

Cypher is a widely used declarative graph database query language. It can be used to query data in GES and returns results. Graph statistics are used in Cypher

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implementation. Currently, the label-based vertex and edge indexes are used during Cypher query and compilation. To use Cypher normally, create indexes by referring to **Cypher Prerequisites**.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-cypher-query

Table 4-251 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Example Request

Execute a Cypher query. The Cypher statement is **match (n) return n limit 1**. The returned results are in the format that each element corresponds to a field in the row.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-cypher-query
{
    "statements": [{
        "statement": "match (n) return n limit 1",
        "parameters": {},
        "resultDataContents": ["row"],
        "includeStats": false
    }]
}
```

Request Parameters

Table 4-252 Request body parameter

Parameter	Mandatory	Type	Description
statements	Yes	List	Statement group that contains one or more statements. The **statements parameters** table describes the format of each element.

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Table 4-253 statements parameters

Parameter	Mandatory	Type	Description
statement	Yes	String	Cypher statement
parameters	Yes	Object	Cypher statement parameters, which are used for parameterized queries. By default, this field is left blank. For details, see **parameterized queries**.
resultDataContents	No	String or List	Format of the returned result. You can set one or more formats. Available values are **row**, **graph**, and **raw** (added in version 2.2.27).
includeStats	No	Boolean	Whether the returned result contains addition, deletion, and modification statistics. If this parameter is not set, the returned result does not contain the information by default.
runtime	No	String	Executor type. The value can be **map** or **slotted**. The default value is **map**. **NOTE** 1. The slotted executor is supported since version 2.3.14. 2. Compared with the map executor, the slotted executor completes more statement data flow analysis in the plan generation phase of statements. In most cases, it executes faster while requiring less memory.
executionMode (2.2.23)	No	String	Execution mode. Set this parameter to **sync** for synchronous execution and to **async** for asynchronous execution. If this parameter is not set, the execution is synchronous by default. For details about how to obtain the query result in asynchronous mode, see **Querying Job Status on the Service Plane**.
limit (2.2.23)	No	Int	Maximum number of results of the asynchronous query. This parameter is valid only when **executionMode** is **sync**. The default value is **100000**.

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NOTE

- You can add the **explain** and **profile** prefixes before the statement to display the query plan.
  - **explain** displays only the query plan but does not execute the statement. The explain prefix is supported since version 2.2.20.
  - **profile** displays the query plan and executes the statement. The profile prefix is supported since version 2.3.12.
- In asynchronous mode (**executionMode** is **async**), Cypher query results can be exported to CSV files (GES 2.3.4 or later supports this function). For details, see **Exporting Job Execution Results to Files**. Currently, the following values can be returned:
  1. Vertex and edge single-value properties, vertex and edge IDs, and group counts.
  2. The current version does not support exporting object types. Objects are converted to null values in the CSV file.

Response Parameters

Table 4-254 Response body parameters

Parameter	Type	Description
results	List	Each element of the list is the return result of a Cypher statement.
errors	List	Each element in the list contains the code and message information in string form.

Table 4-255 Elements of the results parameter

Parameter	Type	Description
columns	List	Name of a returned field
data	List	Returned data value. Each element indicates a record.
stats	Object	Addition, deletion, and modification statistics
plan	Object	If the Cypher statement contains the explain or profile prefix, this field contains the query plan. Otherwise, this field is not displayed. The profile feature is supported since version 2.3.12.
jobId(2.3.10)	String	Asynchronous job ID if the request is executed asynchronously
jobType(2.3.10)	Integer	Type of the asynchronous job if the request is executed asynchronously

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Table 4-256 Elements of the data parameter

Parameter	Type	Description
row	List	Content of a specific row. Each element corresponds to a field in the row. This parameter is displayed only when **resultDataContents** is empty or contains **row**.
meta	List	Type of each field in a row. This parameter is displayed only when **resultDataContents** is empty or contains **row**.
graph	Object	Information returned in graph format. This parameter is displayed only when **resultDataContents** contains **graph**.
raw(2.2.27)	List	Information returned in raw format. This parameter is displayed only when **resultDataContents** contains **raw**.

Table 4-257 stats elements in a response

Parameter	Type	Description
contains_updates	Boolean	Whether data is modified during the query
edges_created	Integer	Number of created edges
edges_deleted	Int	Number of deleted edges
labels_set	Integer	Number of labels that have been set
properties_set	Integer	Number of properties that have been set
vertices_created	Integer	Number of created vertices
vertices_deleted	Integer	Number of deleted vertices

Example Response

Status code: 200

Example response for a successful request (synchronous call)

```
Http Status Code: 200
{
   "results": [
      {
```

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```
        "columns": ["n"],
        "data": [
           {
              "row": [
                 {
                    "occupation": "artist",
                    "gender": "F",
                    "Zip-code": "98133",
                    "userid": 0,
                    "age": "25-34"
                 }
              ],
              "meta": [
                 {
                    "id": "46",
                    "type": "node",
                    "labels": [
                       "user"
                    ]
                 }
              ]
           }
        ],
        "stats": {
           "contains_updates": false,
           "edges_created": 0,
           "edges_deleted": 0,
           "labels_set": 0,
           "properties_set": 0,
           "vertices_created": 0,
           "vertices_deleted": 0
        }

     }
  ],
  "errors": []
}
```


Status code: 200

Example response for a successful request (asynchronous call)


```
Http Status Code: 200
{
  "results": [
     {
        "columns": [
           "jobId",
           "jobType"
        ],
        "jobId": "b64a5846-e306-4f87-b0f1-d595ee2a9910",
        "jobType": 1,
        "data": [
           {
              "row": [
                 "b64a5846-e306-4f87-b0f1-d595ee2a9910",
                 1
              ],
              "meta": [
                 null,
                 null
              ]
           }
        ]
     }
  ],
  "errors": []
}
```


Status code: 400

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Example response for a failed request

```
Http Status Code: 400
{
   "results": [],
   "errors": [
      {
         "code": "GES.8904",
         "message": "Label index in vertices is not found."
      }
   ]
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.14.2 Cypher Prerequisites

The current Cypher query compilation process uses the label-based vertex and edge indexes. To use Cypher normally, use the **index creation API** to create indexes.

- Example command for adding a vertex label index. The index name is **cypher_vertex_index**, and the index type is global vertex index.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/indices
{
      "indexName": "cypher_vertex_index",
      "indexType": "GlobalCompositeVertexIndex",
      "hasLabel": "true",
      "indexProperty": []
}
```

- Example command for adding an edge label index. The index name is **cypher_edge_index**, and the index type is global edge index.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/indices
{
      "indexName": "cypher_edge_index",
      "indexType": "GlobalCompositeEdgeIndex",
      "hasLabel": "true",
      "indexProperty": []
}
```

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NOTE

1. You do not need to create the indexes if the graph is of the 100-million-edge, 1-billion-edge, or 10-billion-edge types. (The GES version must be 2.3.6 or later.)
2. If you need to create indexes, you must create both two indexes (vertex label index and edge label index) at the same time to use Cypher for query.
3. If your graph already has a vertex index or an edge index whose **hasLabel** is **true** and **indexProperty** is empty, you do not need to create the vertex index or edge index again.
4. The API for creating an index is asynchronous. To check whether the index is successfully created, use the **API for querying job status**.
5. If fine-grained permissions are used, a member account must have the schema permission and the read permission on all labels (including the default label **__DEFAULT__**) to create indexes. Otherwise, after an index is created, you need to use an account with the required permissions to send **call db.schema()** to update the compiler cache of Cypher queries.

4.1.14.3 Basic Operations and Compatibility

Basic Operations

Operation	Cypher Statement
Querying vertices	match (n) return n
Querying edges	match (n)-[r]->(m) return n, r, m
Querying paths	match (n:user)-[r]->(m:movie)-->(s:series) return n,r,m,s
Querying information by specifying filtering criteria	match(n:user) where n.userid>=5 return n
Grouping and aggregating	match(n:movie) return n.genres, count(*)
Deduplicating	match(n:movie) return distinct n.genres
Sorting	match(n:movie) return n order by n.movieid
Creating a vertex	create (n:user{userid:1}) return n
Creating an edge	match (n:user{userid:15}),(m:movie{movieid:10}) create (n)-[r:rate]->(m)
Deleting a vertex	match (n:user{userid:1}) delete n
Modifying labels	match (n:user{userid:1}) set n:movie return n
Modifying properties	match (n:user{userid:1}) set n.userid=2 return n

Compatibility to Cypher

1. Cypher clauses

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Cypher implements a couple of clauses. You can combine clauses to implement different query semantics, including vertex and edge filtering, multi-hop query, sorting and deduplication, and grouping and aggregation.

Currently, GES supports the Cypher clauses listed in the following table.

Table 4-258 Supported Cypher clauses

Clause	Support	Example
match	Partially supported	match (n:movie) return n
optional match	Partially supported	optional match (n)-->(m) where id(n)='1' return m
return	Supported	return [1,2,3] as p
with	Supported	match (n) with labels(n) as label, count(*) as count where count > 10 return *
where	Supported	match (n:movie) where n.movieid > 10 return n
order by	Supported	match (n:movie) return n order by n.genres
skip	Supported	match (n:movie) return n order by n.genres skip 5
limit	Supported	match (n:movie) return n order by n.genres skip 5 limit 10
create	Supported	create (n:user{_ID_: 'Jack' }) return n
delete	Supported	match (n:movie)<-[r]-(m:user) delete r
set	Supported	match (n:user{userid:0}) set n.gender='M' return n
call procedures	Supported	call db.schema()
unwind	Supported	unwind [1, 2, 3] as p return p
union	Supported	match (n:movie) return id(n) union match (n:user) return id(n) **NOTE** Union is available for graphs smaller than 10 billion edges only.

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NOTE

1. Currently, merge and foreach operations are not supported. Cypher statements cannot add or delete indexes.
2. GES metadata is not schema-free, and the vertex and edge label properties are strictly restricted. Therefore, the remove operation is not supported.
3. The order by clause does not support sorting of the list type. When Cardinality of the property value is not single, the sorting result is unknown.

– Available items for the match clause

Item	Description	Example Clauses	Earliest Version Required
Vertex pattern	Patterns for matching vertex with specified labels, properties, and IDs.	match (n:movie{title:'hello'}) match (n) where id(n)='xx'	2.2.16
Edge pattern	Patterns for matching directional and non-directional edges with specified labels and properties. Specified IDs of both start and end vertices are supported.	match (n)-[r] -> (m) match (n)-[r]- (m) match (n)-[r:rate{Rating:1}] - (m) match (n)-[r]- (m) where id(n)='x'and id(m)='y'	2.2.16
Path	Anonymous paths	match (n)-[r]->(m)-->(s)	2.2.16
	Named paths	match p=(n)-[r]->(m)-->(s)	2.2.19
Multiple patterns	You can enter multiple patterns after **match** and separate them with commas (,). match (n)-[r]->(m), (m)-->(s)		2.2.16
Multi-match	You can enter multiple match clauses. You can use **with** to connect multiple clauses. match (n)-[r]->(m) with m match (m)-->(s)		2.2.16
Variable-length path pattern	Patterns for matching variable-length paths starting with a specified vertex. match p=(n)-[r*1..3]->(m) where id(n)='xx'return p match p=(n{title:'name'})-[r*1..3]->(m) return p		2.2.19

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	Traversal conditions for matching variable-length paths. match p=(n)-[r*1..3]->(m) where id(n)='xx'and all (x in nodes(p) where x.prop='value1') return p	2.2.28
	Both start vertex and end vertex of a variable-length path can be specified. match p=(n)-[r*1..3]->(m) where id(n)='xx' and id(m)='y' return p	2.3.9
	Deduplication by end vertex is not supported: match p=(n)-[r*1..3]->(m) where id(n)='xx' and id(m)='yy'return distinct m	None

2. Parameterized queries

   Cypher supports parameterized queries. Numeric and string values in a query statement are extracted and converted to parameters for faster compilation, improving the query speed.

   There are some examples of parameterized queries:

   - Example 1

     ```
     POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-cypher-query
     {
         "statements": [{
             "statement": " match (n:user) where n.occupation = $occupation return n",
             "parameters": {
                 "occupation" : "artist"
              },
             "resultDataContents": ["row"]
         }]
     }
     ```

   - Example 2

     ```
     POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-cypher-query
     {
         "statements": [{
             "statement": " match (n:user {`Zip-code`:'98133'}) set n = $props return n",
             "parameters": {
                 "props": {
                 "gender": "M",
                 "age": "56+"
                }
              },
             "resultDataContents": ["row"]
         }]
     }
     ```

   NOTE

   There are some scenarios where parameterized queries are not supported. The following syntax is not valid:

   1. Using **$param** to search by property key and value. For example, **match (n) where n.$param = 'something'**
   2. Using **$code** for vertex and edge labels. For example, **match (n:user) set n:$code**

3. Supported data types

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Currently, GES supports 10 data types: char, char_array, float, double, Boolean, long, Integer, date, enum, and string. Both Boolean and numeric types are supported in the Cypher syntax. The following table lists the mapping between other types and Cypher data types.

Table 4-259 Mapping between data types of GES and Cypher

GES	Cypher	Description
char	String	-
char_array	String	-
string	String	-
enum	String	The Cypher syntax does not provide enum-related syntax. During Cypher query, an enum is converted to a string. When Cypher is used to set properties, values that are not in the enumeration list fail to be set.
date	Temporal	Currently, Cypher dates can be converted into GES dates, but Cypher date functions cannot be used for inputting a date.

Table 4-260 Special types supported by Cypher

Type	Supported	Example
Node	Yes	match (n) return n limit 10
Relationship	Yes	match (n)-[r]->(m) return r limit 10
List	Yes	return [1,2,3] as li
Map	Yes	match (n)-->(m) return {start:id(n), end:id(m)}
Path	Yes	match p=(n1)-[:friends*1..2]-(n2) return p limit 10
Point, Spatial	No	-

NOTE

For the special types listed above, only the List type can be used to match multi-value properties in GES. Other types cannot be used in a set statement for setting the value of a property.

4. Vertex ID compatibility
   - Cypher does not provide the syntax for setting the ID when a vertex is added. In GES, however, an ID of the string type is required to uniquely

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identify a vertex. To use the Cypher syntax in GES, add **_ID_** to specify the ID of a vertex in the create statement. For example, the **create(n{_ID_:'123456'})** statement creates a vertex whose ID is 123456.

- If the ID is not specified, a random ID is generated for the vertex.

  NOTE

  The **_ID_** identifier is supported only in the create statement. The match and set clauses do not support the **_ID_** identifier. In the match clause, you can use the **id()** function to obtain the vertex ID.

4.1.14.4 Supported Expressions, Functions, and Procedures

Expression

Cypher queries support multiple expressions and can be used in combination to form various filter criteria. Currently, the following expressions are supported.

Operation Type	Expression	Example
Logical operations	and	match (n:user) where n.age='Under 18' and n.gender='F' return n
	or	match(n:user) where n.`Zip-code`='22181' or n.userid=6 return n
	not	match(n:movie) where not n.genres contains 'Drama' return n
Null value judgment	is null	match (n) where n.userid is null return n
	is not null	match (n) where n.userid is not null return n
Comparison calculation	>,>=,<,<=,=,<>	match(n:user) where n.userid>=5 return n
Arithmetic operators (2.3.10)	+,-,*,/,%,^	return (1+3)%3
String comparisons	starts with	match(n:movie) where n.genres starts with 'Comedy' return n
	ends with	match(n:movie) where n.genres ends with 'Drama' return n
	contains	match(n:movie) where n.genres contains 'Drama' return n
List-related operation	in	match(n:student) where 'math' in n.courses return n

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Operation Type	Expression	Example
	[]	match(n:user) return n[' userid'] with [1, 2, 3, 4] as list return list[0] with [1, 2, 3, 4] as list return list[0..1] match p=(n)-->(m) return [x in nodes(p) where x.gender='F'|id(x)]
Date expressions (2.3.10)	.year, .month, .day, .hour, .minute, .second, .dayOfWeek	Year, month, and day of a specific date: with '2000-12-27 23:44:41' as strVal with datetime(strVal) as d2 return d2.year, d2.month, d2.day, d2.hour, d2.minute, d2.second,d2.dayOfWeek, d2.ordinalDay

NOTE

The where clause in Cypher queries does not support regular expressions.

Function

Cypher supports the following functions for grouping, aggregation, and vertex and edge operations:

1. Aggregate

   Aggregate functions **count** and **collect** are supported.

Function	Earliest Version Supported	Description	Example
count	2.2.17	Returns the total number of results.	match (n) return count(*) match (n) return count(n.userid)
collect	2.2.17	Collects results into a list.	match (n:movie) return n.genres, collect(n) as movieList
sum	2.3.3	Returns the sum of values.	unwind [1, 2.0, 3] as p return sum(p)
avg	2.3.3	Returns the average of values.	unwind [1, 2.0, 3] as p return avg(p)
min	2.3.3	Returns the minimum value.	unwind [1, 2.0, 3] as p return min(p)

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Function	Earliest Version Supported	Description	Example
max	2.3.3	Returns the maximum value.	unwind [1, 2.0, 3] as p return max(p)

2. Regular functions

   Based on the types of input parameters, regular functions are classified into vertex and edge functions, path functions, list functions, and value functions.

Table 4-261 Vertex and edge functions

Function	Earliest Version Supported	Description	Example
id	2.2.16	Obtains the ID of a vertex.	match (n) return id(n)
labels	2.2.16	Obtains labels of a vertex.	match (n) return labels(n)
type	2.2.16	Obtains the label of an edge.	match(n)-[r]->(m) return type(r)
degree	2.2.26	Obtains the degree of a vertex.	match (n) where id(n)='Vivian' return degree(n)
inDegree	2.2.26	Obtains the indegree of a vertex.	match (n) where id(n)='Vivian' return inDegree(n)
outDegree	2.2.26	Obtains the outdegree of a vertex.	match (n) where id(n)='Vivian' return outDegree(n)
startNode	2.3.10	Obtains the start vertex of an edge.	match (n)-[r]->(m) return startNode(r)
endNode	2.3.10	Obtains the end vertex of an edge.	match (n)-[r]->(m) return endNode(r)

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Table 4-262 Path functions

Function	Earliest Version Supported	Description	Example
nodes	2.2.19	Obtains the list of vertices on a path.	match p=(n)-[:friends*1..2]->(m) return nodes(p)
relationships	2.2.19	Obtains the list of edges on a path.	match p=(n)-[:friends*1..2]->(m) return relationships(p)
length	2.2.19	Obtains the path length.	match p=(n)-[:friends*1..2]->(m) return length(p)

Table 4-263 List functions

Function	Earliest Version Supported	Description	Example
head	2.3.10	Obtains the first element of a list.	with [1,2,3,4] as list return head(list)
last	2.3.10	Obtains the last element of a list.	with [1,2,3,4] as list return last(list)
size	2.3.10	Obtains the list length.	with [1,2,3,4] as list return size(list)
range	2.3.10	Generates a list.	return range(1,5), range(1,5,2)

Table 4-264 Value functions

Function	Earliest Version Supported	Description	Example
toString	2.2.21	Converts a value to a string.	match (n) where toString(labels(n)) contains 'movi' return n
toUpper	2.2.26	Converts a string into uppercase letters.	match (n:movie) return toUpper(n.title)

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toLower	2.2.26	Converts a string into lowercase letters.	match (n:movie) return toLower(n.title)
toInteger	2.2.29	Converts a string to an int number.	with '123' as p return toInteger(p)
toLong	2.2.29	Converts a string to a long number.	with '123' as p return toLong(p)
toFloat	2.2.29	Converts a string to a float number.	with '123.4' as p return toFloat(p)
toDouble	2.2.29	Converts a string to a double number.	with '123.4' as p return toDouble(p)
toBoolean	2.2.29	Converts a string to a bool value.	with 'true' as p return toBoolean(p)
size	2.2.29	Obtains the string length.	with 'GES' as p return size(p)
subString	2.3.10	Truncates a part of a string.	return subString('abc', 1), subString('abcde', 1,2)
coalesce	2.3.10	Obtains the first non-null value of the parameters.	return coalesce(null, '123')

Table 4-265 Mathematical functions

Function	Earliest Version Supported	Description	Example
floor	2.3.10	Rounds a number down to the nearest integer.	return floor(4.1)
ceil	2.3.10	Rounds a number up to the nearest integer.	return ceil(4.1)

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Function	Earliest Version Supported	Description	Example
round	2.3.14	Round	return round(3.4), round(3.5)
abs	2.3.14	Absolute value function	return abs(-3),abs(-3.5)
sin	2.3.14	Sine function	return sin(pi()/2)
cos	2.3.14	Cosine function	return cos(0),cos(pi()/2)
tan	2.3.14	Tangent function	return tan(pi()/4)
acos	2.3.14	Inverse cosine function	return acos(1)
asin	2.3.14	Inverse sine function	return asin(0)
atan	2.3.14	Inverse tangent function	return atan(1)
cot	2.3.14	Cotangent function	return cot(pi()/4)
radians	2.3.14	Converts degree to radian	return radians(180)
degrees	2.3.14	Converts radian to degree	return degrees(pi())
pi	2.3.14	Returns the approximate value of Pi (π).	return pi()

Table 4-266 Date and time functions

Function	Earliest Version Supported	Description	Example
datetime(val)	2.3.10	Returns the time based on the timestamp.	return datetime(1688696395)

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datetime()	2.3.14	Obtains the current time (valid only for read statements).	return datetime()
timestamp(val)	2.3.10	Returns the timestamp based on the time string.	return timestamp('2023-07-07 02:20:42')
timestamp()	2.3.14	Obtains the current timestamp (valid only for read statements).	return timestamp()
localDatetime	2.3.14	Converts a time or timestamp to a local time string.	return localDatetime(timestamp())

Table 4-267 Predicate functions

Function	Earliest Version Supported	Description	Example
all	2.2.19	If all elements meet the expression, **true** is returned.	all (x in p where x>1)
any	2.2.19	If any element meets the expression, **true** is returned.	any (x in p where x>1)
none	2.2.19	If all elements cannot meet the expression, **true** is returned.	none (x in p where x>1)

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Function	Earliest Version Supported	Description	Example
single	2.2.19	If only one element meets the expression, **true** is returned.	single (x in p where x>1)

Table 4-268 Algorithm expressions

Function	Earliest Version Supported	Description	Example
shortestPath	2.3.2	Returns the shortest path between two vertices.	The following statement returns the shortest path between the given vertices **n** and **m**. The direction is m to n, and the edge label is **rate**: with n,m, shortestPath((n)<-[:rate*]-(m)) as p return p
allShortestPaths	2.3.2	Returns all shortest paths between two vertices.	The following statement returns all shortest paths between the given vertices **n** and **m**: with n,m, allShortestPaths((n)-[*]-(m)) as p return p

NOTE

Procedure

Currently, GES supports the following procedures.

Procedure	Statement
Obtaining graph pattern information	call db.schema()
Obtaining vertex labels	call db.labels()
Obtaining edge labels	call db.relationshipTypes()
Querying the Cypher statements that are being executed	call dbms.listQueries()

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Procedure	Statement
Terminating a Cypher statement based on **queryId**	call dbms.killQuery('queryId')
Querying indexes	call db.indexes()
Full-text indexing for querying vertices that meet the search conditions	call db.index.fulltext.queryNodes()
Full-text indexing for querying edges that meet the conditions	call db.index.fulltext.queryRelationships()

NOTE

Full-text indexes support six types of queries: prefix, wildcard, regexp, fuzzy, match, and combine. To use full-text indexes, you need to call the API for creating a full-text index.

NOTE

Function and procedure names are case sensitive and must be in lower camel case.

- Example of a full-text index query request

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-cypher-query
{
    "statements": [
        {
            "statement": "call db.index.fulltext.queryNodes('combine', {title:'1977'}) yield node, score return node, score skip 1 limit 10",
            "resultDataContents": [
                "row"
            ],
            "parameters": {}
        }
    ]
}
```

- Parallel edge processing policy

  When using Cypher to add edges, you can add duplicate edges. Duplicate edges are two edges with the same source vertex and target vertex.

- How to add an edge without a label

  When you use a Cypher statement to add an edge, set the label of the edge to the default value **__DEFAULT__**. For example, **create ()-[r:__DEFAULT__]->() return r**.

Querying the Schema Structure Using Cypher

- Function

  You can call the **db.schema ()** function using Cypher to query the structure of a generated schema (obtained from OBS).

- Query statement
  - Name: Schema structure query
  - Statement: **call db.schema()**

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- Note:

  If you did not call the API for generating the schema structure, the returned schema file contains all labels.

  If you have called the API for generating the schema structure, this API returns the labels as the vertices and the relationships between the labels as edges.

4.1.15 Filtered Query

Function

This API filters the k-hop process layer by layer, and lists the k hop vertices or edges that meet the filtering criteria.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=filtered-query

Table 4-269 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

NOTE

If **executionMode** is **sync**, the number of returned vertices cannot exceed 100,000.

Table 4-270 Request body parameters

Parameter	Mandatory	Type	Description
executionMode	No	String	• **sync**: synchronous • **async**: asynchronous The default value is **sync**, indicating synchronous response.
vertices	Yes	Array of Json	List of IDs of source vertices you want to query

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Parameter	Mandatory	Type	Description
query_type	No	String	Possible values are **Default**, **AllVertices**, **SimpleEdges**, **Path**. • **Default** indicates the default mode, that is, the *k* hop is returned. • **AllVertices** returns details about all vertices within *k* hops. • **SimpleEdges** returns all edges within *k* hops, contain only the ID and label information of the edges. • **Path** returns the path information, that is, the set of paths.
by	No	Array of Json	Specified output field. This parameter is valid only when **query_type** is set to **Default** or **AllVertices**. Currently, only one layer is supported. If this parameter is not specified, all content is output by default.
edges	No	Array of Json	List of edges to be queried. Either this parameter or **vertices** is selected. For details, see **Table 4-271**.
filters	Yes	Array of Json	Filter criteria. Each element in the array corresponds to a filter. For details about the formats, see **Table 4-272**.
full_path	No	Boolean	Whether to return a complete path. The default value is **false**. • If the value is **true**, the paths from the source vertex to all leaf vertices are returned. • If the value is **false**, the paths from the source vertex to the leaf vertices at layer **k** are returned.
visualized	No	Boolean	Whether to enable visualization. The default value is **false**. In asynchronous mode: • When **visualized** is **false**, the job query result is returned on multiple pages. • When **visualized** is **true**, the job query result is returned on one page.

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Parameter	Mandatory	Type	Description
restricted(2.2.28)	No	Boolean	Whether the input is restricted. The default value is **true**. • **true**: If **vertices** contains vertices that do not exist, the query exits and an error is reported. • **false**: The system filters out vertices that do not exist and then performs the query task.

Table 4-271 edges element formats

Parameter	Mandatory	Type	Description
source	Yes	String	Source vertex ID
target	Yes	String	Target vertex ID
index	No	String	Indexes of edges in the source edge set

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Table 4-272 Filters element formats

Parameter	Mandatory	Type	Description
operator	Yes	String	Query type. Possible values: • **inV**: incoming vertex • **outV**: outgoing vertex • **bothV**: incoming and outgoing vertices • **vertex**: all vertices. Filtering is available only at the first layer. If vertices are input in the beginning, the first-layer output is the input vertices. If no vertices are input in the beginning, all vertices are output at the first layer. • **in**: incoming edge • **out**: outgoing edge • **both**: incoming and outgoing edges • **edge**: all edges. Filtering is available only at the first layer. The usage is similar to that of vertices The query result of the previous layer is the input of the next layer. • If the result of the previous layer is a vertex, the corresponding operations can be **inV**, **outV**, **bothV**, **in**, **out**, and **both**. • If the result of the previous layer is an edge, the corresponding operation can be **inV**, **outV**, and **bothV**.
vertex_filter	No	String	This parameter is optional when **operator** is set to **inV**, **outV**, or **bothV**. For details about the formats, see **Table 4-274**.
edge_filter	No	String	This parameter is optional when **operator** is set to **in**, **out**, or **both**. For details about the formats, see **Table 4-274**.

Table 4-273 by element formats

Parameter	Mandatory	Type	Description
id	No	Boolean	Whether to output the ID. The default value is **false**.
label	No	Boolean	Whether to output the label. The default value is **false**.

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Parameter	Mandatory	Type	Description
properties	No	Boolean	Whether to output properties. The default value is **false**.
selectedProperties	No	Array of String	When **properties** is set to **true**, you can select the properties to be output. If this parameter is left blank, all properties are output. By default, this parameter is left blank.

Table 4-274 property_filter elements

Parameter	Mandatory	Type	Description
leftvalue	Yes	String	Left value. For details about the formats, see **Table 4-275**.

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Parameter	Mandatory	Type	Description
predicate	Yes	String	Filtering type. The supported operations include: Relational operators: • =: equal to • !=: not equal to • <: less than • ≤: Less than or equal to • >: greater than • ≥: greater than or equal to Logical operations: • &: and • |: or Set operations: • IN/NOTIN: whether the left value and right value have an intersection • CONTAIN/NOTCONTAIN: whether the property value contains the right value. • SUBSET: The right value is a subset of the property value. Match operators: • PREFIX: The right value is the prefix of the left value. • NOTPREFIX: The right value is not the prefix of the left value. • SUFFIX: The right value is the suffix of the left value. • NOTSUFFIX: The right value is not the suffix of the left value. • SUBSTRING: The right value is a sub-string of the left value. • NOTSUBSTRING: The right value is not a sub-string of the left value. • FUZZY: fuzzy match • REGEX: expression match • CISUBSTRING: sub-string that ignores cases HAS/HASNOT: whether this property exists. Only property filtering is supported. That is, the left value can only be **property_name**.
rightvalue	Yes	String	Right value. For details about the formats, see **Table 4-276**.

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Table 4-275 leftvalue elements

Parameter	Mandatory	Type	Description
label_name	No	String	If **label** is used as the filter criterion, **label_name** can be selected and the value is **labelName**. Set the **value** field of **rightvalue** to the label name.
property_name	No	String	If **property** is used as the filter criterion, set this parameter to the property name and set **value** of **rightvalue** to the property value.
id	No	String	If the vertex ID is filtered, this parameter is optional.
property_filter	No	String	If **predicate** is set to **&** or |, **property_filter** can be nested in **leftvalue** and **rightvalue**.

Table 4-276 rightvalue elements

Parameter	Mandatory	Type	Description
value	Yes	String	• If **label** is used as the filter criterion, the value is the label name. • If **property** is used as the filter criterion, the value is the property name.
property_filter	No	String	If **predicate** is set to **&** or |, **property_filter** can be nested in **leftvalue** and **rightvalue**.

Table 4-277 predicate supported left values

predicate	label_name	id	property_name	Nested Filters
&	No	No	No	Yes
|	No	No	No	Yes
HAS/HASNOT	No	No	Yes	No
CONTAIN/ NOTCONTAIN	No	No	Yes	No

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predicate	label_name	id	property_name	Nested Filters
SUBSET	No	No	Yes	Yes (Only the right value set is supported. If the right value is single, no filtering function is available.)
IN/NOTIN	Yes	Yes	Yes	Yes (Only the right value set is supported. If the right value is single, no match is available.)
PREFIX	Yes	Yes	Yes	No
FUZZY	Yes	Yes	Yes	No
REGEX	Yes	Yes	Yes	No
SUBSTRING	Yes	Yes	Yes	No
CISUBSTRING	Yes	Yes	Yes	No
=/!=/</<=/>/>=	Yes	Yes	Yes	No

NOTE

- The left value set is supported. The left value in the body is a string.
- The right value set is supported. If you select **No**, only the first character string in the set is matched even if the right value set is supported.
- Boolean value matching. When the right value is **true**, the value is identified as true for matching. Otherwise, the value is identified as false for matching.

Response Parameters

- Synchronous response

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Table 4-278 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Query results. This parameter is left blank when the query fails.

Table 4-279 data parameter description

Parameter	Type	Description
vertices	List	Vertex result set. If the last layer of **filters** is vertex filtering, the **data** contains vertices.
edges	List	Edge result set. If the last layer of **filters** is edge filtering, the **data** contains edges.
paths	List	Path set. This parameter is available only when **with_path** is set to **true**. For details about the formats, see **Table 4-280**.

Table 4-280 path parameter description

Parameter	Type	Description
source	String	Source vertex ID
target	String	Target vertex ID
index	String	Edge index
label	String	Edge label

- Asynchronous response

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Table 4-281 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. ● If execution succeeds, this parameter may be left blank. ● If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. ● If execution succeeds, this parameter may be left blank. ● If execution fails, this parameter is used to display the error code.
jobId	String	ID of the algorithm execution job. This parameter is left blank when the request fails.
jobType	Integer	Job type. This parameter is left blank when the request fails.

Example Request

- (Synchronous mode) List the kth-hop vertices or edges that meet filter criteria. The execution mode is synchronous. Visualization is not performed. That is, job query results are displayed on multiple pages.

```
POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=filtered-query
{
    "executionMode": "sync",
    "visualized": "false",
    "filters": [
        {
            "operator": "outV"
        },
        {
            "operator": "out",
            "edge_filter": {
                "property_filter": {
                    "leftvalue": {
                        "label_name": "labelName"
                    },
                    "predicate": "=",
                    "rightvalue": {
                        "value": "rate"
                    }
                }
            }
        }
    ],
    "full_path": false,
    "vertices": [
        "tr_10"
    ]
}
```

- (Asynchronous mode) List the kth-hop vertices or edges that meet filter criteria. The execution mode is asynchronous. Visualization is not performed. That is, job query results are displayed on multiple pages.

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```
POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=filtered-query
{
   "executionMode": "async",
   "visualized": "false",
   "filters": [
      {
         "operator": "outV"
      },
      {
         "operator": "out",
         "edge_filter": {
            "property_filter": {
               "leftvalue": {
                  "label_name": "labelName"
               },
               "predicate": "=",
               "rightvalue": {
                  "value": "rate"
               }
            }
         }
      }
   ],
   "full_path": false,
   "vertices": [
      "tr_10"
   ]
}
```

- property_filter is nested. List the kth-hop vertices or edges that meet filter criteria. The execution mode is synchronous. Visualization is not performed. That is, job query results are displayed on multiple pages.

```
{
   "executionMode": "sync",
   "filters": [
      {
         "operator": "outV",
          "vertex_filter": {
             "property_filter": {
                "leftvalue": {
              "property_filter": {
                "leftvalue": {
                    "property_name": "genres"
                 },
               "predicate": "PREFIX",
               "rightvalue": {
               "value": "A|"
         }
        }
      },
            "predicate": "&",
            "rightvalue": {
            "property_filter": {
            "leftvalue": {
            "label_name": "labelName"
         },
            "predicate": "=",
             "rightvalue": {
              "value": "movie"
          }
         }
        }
      }
    }
   }
 ],
      "vertices": [
      "tr_3"
```

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```
 ]
}
```

Example Response

- Synchronous response

  Status code: 200

  Example response for a successful request

```
Http Status Code: 200
{
   "data": {
      "edges": [
         {
            "index": "1",
            "source": "tr_1",
            "label": "rate",
            "properties": {
               "Rating": [
                  0
               ],
               "Datetime": [
                  ""
               ]
            },
            "target": "tr_3"
         },
         ......,
         {
            "index": "199998",
            "source": "tr_1",
            "label": "rate",
            "properties": {
               "Rating": [
                  0
               ],
               "Datetime": [
                  ""
               ]
            },
            "target": "tr_200000"
         }
      ]
   }
}
```

  Status code: 400

  Example response for a failed request

```
Http Status Code: 400
{
   "errorMessage": "graph [tesdt_117] is not found",
   "errorCode": "GES.8806"
}
```

- Asynchronous response

  Status code: 200

  Example response for a successful request

```
Http Status Code: 200
{
   "jobId": "6622f13c-4b88-45f5-89a9-eaa096647c4a",
   "jobType": 1
}
```

  Status code: 400

  Example response for a failed request

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```
Http Status Code: 400
{
   "errorMessage": "executionMode is not correct, it should be sync or async",
   "errorCode": "GES.8806"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.16 Filtered Query V2

Function

This is a new version of the Filtered Query API. This API supports both Filtered Query and Repeat Query functions.

NOTE

You can use this API to accelerate multi-hop filtered query and looped traversal query.

For example, a Gremlin statement is as follows:

g.V('node1').repeat(out('label_2')).emit()

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=path-query

Table 4-282 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

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Request Parameters

NOTE

The number of elements in each traversal cannot exceed 100 million.

Table 4-283 Request body parameters

Parameter	Mandatory	Type	Default Value	Description
executionMode (2.2.22)	No	String	sync	Execution mode of the query task. The value can be **sync** (synchronously) or **async** (asynchronously).
vertices	Yes	Array of Json	None	List of IDs of source vertices you want to query
repeat	Yes	Array of Json	None	Filter criteria for repeat queries. Each element in the array corresponds to a filter. For details about the format, see **Table 4-285**.
until (2.2.22)	No	Array of Json	None	Conditions to stop the traversal. The logic is similar to while/do loop. For details about the format, see **until elements**. For APIs of the 2.2.22 version, **until** supports only one stop condition.
times	No	int	2	Maximum number of steps. The default value is **2**, and the maximum value is **20**.
emit	No	Boolean	false	Whether all elements will be returned. The default value is **false**. If **select** and **as** are configured, or **queryType** is set to **Tree**, this parameter determines whether vertices that are not on the final complete path will be returned.
limit	No	int	10000	Number of vertices, edges, or paths.
queryType(2.2.22)	No	String	Default	Type of the query. The value can be **Default** or **Tree**. **Default** means that the path query result will be returned. **Tree** means that the path information of the path query will be returned in the tree structure.

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Parameter	Mandatory	Type	Default Value	Description
select (2.2.21)	No	Array of String	None	Fields you want to be displayed in the result. The values can be the fields set in the **as** parameter, or you can set the **by** parameter together with this parameter to control output content. If you set the **by** parameters together, you can set **select** to **v0**, **v1**, **v2**, ..., and **vtimes**: • **v0**: layer 0 of the k hops • **v1**: the first layer of the K hops • **v2**: the second layer of the K hops The path selected by this parameter is deduplicated by default.
by(2.2.21)	No	Array of Json	Output all	Content of output fields. 1. If this parameter is not specified, all content is output by default. 2. If the **select** parameter is configured, the number of **by** must be the same as the number of **select**. Each **by** can output only one element. 3. If **select** is not configured, **by** takes effect on the final result set. For details, see **by elements**.
statistics	No	Boolean	false	Whether only the number of hit records will be returned. The default value is **false**.
mode	No	Boolean	None	Traversal mode that will be set forcibly. The value can be **Dense** or **Sparse**. The default mode is automatically switched based on the graph structure.
strategy	No	String	ShortestPath	Traversal policy. The value can be **ShortestPath** or **Walk**.

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Parameter	Mandatory	Type	Default Value	Description
restricted(2.2.28)	No	Boolean	true	Whether the input is restricted. The default value is **true**. • **true**: If **vertices** contains vertices that do not exist, the query exits and an error is reported. • **false**: The system filters out vertices that do not exist and then performs the query task.

Table 4-284 by elements

Parameter	Mandatory	Type	Description
id	No	Boolean	Whether to output the ID. The default value is **false**.
label	No	Boolean	Whether to output the label. The default value is **false**.
properties	No	Boolean	Whether to output properties. The default value is **false**.
selectedProperties	No	Array of String	When **properties** is set to **true**, you can select the properties to be output. If this parameter is left blank, all properties are output.

Table 4-285 repeat elements

Parameter	Mandatory	Type	Description
operator	Yes	String	Type of the query. The value can be **inV** (incoming vertex), **outV** (outgoing vertex), and **bothV** (incoming and outgoing vertices).
vertex_filter	No	JSON String	Search conditions for the next hop. For details about the format, see **property_filter elements**.
edge_filter	No	JSON String	Edge search conditions. For details about the format, see **property_filter elements**.
as	No	JSON String	Alias of elements at this layer. The value can be used to select output fields.

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Table 4-286 until elements

Parameter	Mandatory	Type	Description
vertex_filter	No	JSON String	This parameter is optional when **operator** in **repeat** is set to **inV**, **outV**, or **bothV**. For details about the format, see **property_filter elements**.

Table 4-287 property_filter elements

Parameter	Mandatory	Type	Description
leftvalue	Yes	String	Left value of a search condition. For details, see **leftvalue elements**.

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Parameter	Mandatory	Type	Description
predicate	Yes	String	Filtering type. The options are as follows: Relational operators: • =: equal to • !=: not equal to • <: less than • ≤: less than or equal to • >: greater than • ≥: greater than or equal to Logical operations: • &: and • |: or Set operations: • IN/NOTIN: whether the left value and right value have an intersection • CONTAIN/NOTCONTAIN: whether the property value contains the right value. • SUBSET: The right value is a subset of the property value. Match operators: • PREFIX: The right value is the prefix of the left value. • NOTPREFIX: The right value is not the prefix of the left value. • SUFFIX: The right value is the suffix of the left value. • NOTSUFFIX: The right value is not the suffix of the left value. • SUBSTRING: The right value is a sub-string of the left value. • NOTSUBSTRING: The right value is not a sub-string of the left value. • FUZZY: fuzzy match • REGEX: expression match • CISUBSTRING: sub-string that ignores cases HAS/HASNOT: whether this property exists. Only property filtering is supported. That is, the left value can only be **property_name**.
rightvalue	Yes	String	Right value. For details about the format, see **rightvalue elements**.

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Table 4-288 leftvalue elements

Parameter	Mandatory	Type	Description
label_name	No	String	If **label** is used as the filter criterion, **label_name** can be selected and the value is **labelName**. Set the **value** field of **rightvalue** to the label name.
property_name	No	String	If **property** is used as the filter criterion, set this parameter to the property name and set **value** of **rightvalue** to the property value.
id	No	String	If the vertex ID is filtered, this parameter is optional.
property_filter	No	JSON String	If **predicate** is set to **&** or |, **property_filter** can be nested in **leftvalue** and **rightvalue**.
degree	No	String	Direction of vertex degree filtering statistics. This parameter is optional. The value can be **both**, **in**, or **out**.

Table 4-289 rightvalue elements

Parameter	Mandatory	Type	Description
value	Yes	String	If **label** is used as the search criterion, the value is the label name. If **property** is used as the search criterion, the value is the property name.
property_filter	No	JSON String	If **predicate** is set to **&** or |, **property_filter** can be nested in **leftvalue** and **rightvalue**.

Table 4-290 predicate supported left values

predicate	label_name	id	property_name	Nested Filters
&	No	No	No	Yes
|	No	No	No	Yes
HAS/HASNOT	No	No	Yes	No
=/!=/</<=/>/>=	Yes	Yes	Yes	No

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Response Parameters

- Synchronous response

  Table 4-291 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Query results. This parameter is left blank when the query fails.

  Table 4-292 data parameter description

Parameter	Type	Description
vertices	List	Vertex result set. If the last layer of **filters** is vertex filtering, the **data** contains vertices.
edges	List	Edge result set. If the last layer of **filters** is edge filtering, the **data** contains edges.

- Asynchronous response

  Table 4-293 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.

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Parameter	Type	Description
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
job_id	String	ID of the algorithm execution job. This parameter is left blank when the request fails.
jobType	Integer	Job type. This parameter is left blank when the request fails.

Example Request

- Example request 1: List the kth-hop vertices or edges that meet filter criteria. The query type is outgoing vertex, and the query is performed on the next-hop vertex.

```
POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=path-query
{
  "repeat":[
    {
      "operator":"outV",
      "vertex_filter":{
        "property_filter":{
          "leftvalue":{
            "label_name":"labelName"
          },
          "predicate":"=",
          "rightvalue":{
            "value":"rate"
          }
        }
      }
    }
  ],
  "times":2,
  "vertices":[
    "1","2"
  ]
}
```

  NOTE

  The preceding request is equivalent to this Gremlin statement: **g.V('1','2').repeat(out().hasLabel('rate').times(2).dedup()**.

- Example request 2: List the kth-hop vertices or edges that meet filter criteria. The query type is outgoing vertex, and the query is performed on the next-hop vertex.

```
POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=path-query
{
  "repeat":[
    {
      "operator":"outV",
      "vertex_filter":{
        "property_filter":{
          "leftvalue":{
            "label_name":"labelName"
```

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```
        },
        "predicate":"=",
        "rightvalue":{
          "value":"rate"
        }
      }
    }
  }
 ],
 "until":[
  {
    "vertex_filter":{
     "property_filter":{
      "leftvalue":{
        "property_name":"movieid"
      },
      "predicate":"=",
      "rightvalue":{
        "value":"1"
      }
     }
    }
  }
 ],
 "vertices":[
  "v1","v2"
 ]
}
```

NOTE

The preceding request is equivalent to this Gremlin statement:

g.V('v1','v2').repeat(out().hasLabel('rate')).until(has('movieid','1')).dedup()

Example Response

- Synchronous response

  Status code: 200

  Example response for a successful request

```
{
    "data":{
        "vertices":[
            {
                "id":"51",
                "label":"user",
                "properties":{
                    "occupation":[
                        "homemaker"
                    ],
                    "gender":[
                        "F"
                    ],
                    "Zip-code":[
                        "46911"
                    ],
                    "userid":[
                        5
                    ],
                    "age":[
                        "56+"
                    ]
                }
            }
        ]
    }
}
```

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Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
    "errorMessage": "graph [tesdt_117] is not found",
    "errorCode": "GES.8806"
}
```

- Asynchronous response

  Status code: 200

  Example response for a successful request

  ```
  Http Status Code: 200
  {
      "jobId": "6622f13c-4b88-45f5-89a9-eaa096647c4a",
      "jobType": 1
  }
  ```

  Status code: 400

  Example response for a failed request

  ```
  Http Status Code: 400
  {
      "errorMessage": "executionMode is not correct, it should be sync or async",
      "errorCode": "GES.8806"
  }
  ```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.17 Updating Specified Properties of Vertices and Edges by Importing a File

Function

This API is used to update specified properties of vertices and edges by importing a file.

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> **NOTE**
>
> To prevent failures in restoring the updated graph data during system restarting, do not delete the data stored on OBS when the graph is in use.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=import-properties

Table 4-294 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Example Request

Import a file to update specified properties of vertices and edges. The vertex file directory is **datasets/movie/movie.csv**, and the vertex data set format is CSV. The edge file directory is **datasets/movie/ranking_edge.csv**, and the edge data set format is CSV.

```
POST http://Endpoint/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=import-properties
{
  "vertexsetPath": "datasets/movie/movie.csv",
  "vertexsetFormat": "csv",
  "vertexProperties": [
    {
      "label": "movie",
      "properties": [
        "genres"
      ]
    }
  ],
  "edgesetPath": "datasets/movie/ranking_edge.csv",
  "edgesetFormat": "csv",
  "edgeProperties": [
    {
      "label": "rate",
      "properties": [
        "Datetime"
      ]
    }
  ],
  "targetProperties": [
    {
      "label": "rate",
      "properties": [
        "Rating"
      ]
    }
  ],
  "delimiter": ",",
```

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```
  "trimQuote": "\"",
  "obsParameters": {
    "accessKey": "XXXXXXX",
    "secretKey": "XXXXXXX"
  },
  "vertexFileContainLabel":  true
}
```

Request Parameters

NOTE

The format of the CSV file for updating properties is as follows:

- Vertex file (including **label**): vertex ID,**label**,**property_1**...**property_*n***
- Vertex file (excluding **label**): vertex ID,**property_1**...**property_*n***
- Edge file: source vertex ID, target vertex ID, label, edge ID, **property_1**...**property_*n***

Table 4-295 Request body parameters

Parameter	Mandatory	Type	Description
vertexsetPath	Either **vertexsetPath** or **edgesetPath** is mandatory.	String	Vertex file directory or name
vertexsetFormat	No	String	Format of the vertex data set. Currently, only the CSV format is supported. The CSV format is used by default.
vertexProperties	Mandatory if **vertexsetPath** exists	Object	Label of a vertex and list of properties to be updated in a vertex file, in JSONArray format For details, see **Table 4-296**.
edgesetPath	Either **vertexsetPath** or **edgesetPath** is mandatory.	String	Edge file directory or name
edgesetFormat	No	String	Format of the edge data set. Currently, only the CSV format is supported. The CSV format is used by default.
edgeProperties	Mandatory if **edgesetPath** exists	Object	Label of an edge and list of properties to be updated in an edge file, in JSONArray format For details, see **Table 4-297**.

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Parameter	Mandatory	Type	Description
targetProperties	Mandatory if **edgesetPath** exists	Object	Indicates property information used to distinguish duplicate edges in the edge file, in JSONArray format. For details, see **Table 4-298**.
delimiter	No	Character	Field separator in a CSV file. The default value is comma (,). The default element separator in a field of the list/set type is semicolon (;).
trimQuote	No	Character	Field quote character in a CSV file. The default value is double quotation marks ("). They are used to enclose a field if the field contains separators or line breaks.
obsParameters	Yes	String	OBS authentication parameters. For details, see **Table 4-299**.
vertexFileContainLabel	No	Boolean	Whether the vertex file contains label information. This parameter is optional. The default value is **true**.

Table 4-296 vertexProperties parameter description

Parameter	Mandatory	Type	Description
label	Yes	String	Name of a label
properties	Yes	Object	Properties to be updated, in JSONArray format. The sequence of the properties must be the same as that in the vertex file.

Table 4-297 edgeProperties parameter description

Parameter	Mandatory	Type	Description
label	Yes	String	Name of a label
properties	Yes	Object	Properties to be updated, in JSONArray format. The sequence of the properties must be the same as that in the edge file.

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Table 4-298 targetProperties parameter description

Parameter	Mandatory	Type	Description
label	Yes	String	Name of a label
properties	Yes	Object	Edge ID properties, in JSONArray format. Currently, only one property is supported.

Table 4-299 obsParameters parameter description

Parameter	Mandatory	Type	Description
accessKey	Yes	string	AK value
secretKey	Yes	string	SK value

Response Parameters

Table 4-300 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of an asynchronous job **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
```

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```
  "jobId": "b4f2e9a0-0439-4edd-a3ad-199bb523b613"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "parameter format error",
  "errorCode": "GES.8013"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.18 Deleting Vertices and Edges by Files

Function

This API is used to delete vertices and edges by reading the files.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=delete-by-file

Table 4-301 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Example Request

Delete vertices and edges by reading files. The vertex file directory is **datasets/movie/movie.csv**, and the vertex data set format is CSV. The edge file directory is **datasets/movie/ranking_edge.csv**, and the edge data set format is CSV.

```
POST http://Endpoint/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=delete-by-file
{
  "vertexsetPath": "datasets/movie/movie.csv",
  "vertexsetFormat": "csv",
  "edgesetPath": "datasets/movie/ranking_edge.csv",
  "edgesetFormat": "csv",
  "targetProperties": [
    {
      "label": "rate",
      "properties": [
        "Rating"
      ]
    }
  ],
  "delimiter": ",",
  "trimQuote": "\"",
  "obsParameters": {
  "accessKey": "XXXXXXX",
  "secretKey": "XXXXXXX"
  }
}
```

Request Parameters

Table 4-302 Request body parameters

Parameter	Mandatory	Type	Description
vertexsetPath	Either **vertexsetPath** or **edgesetPath** is mandatory.	String	Vertex file directory or name
vertexsetFormat	No	String	Format of the vertex data set. Currently, only the CSV format is supported. The CSV format is used by default.
edgesetPath	Either **vertexsetPath** or **edgesetPath** is mandatory.	String	Edge file directory or name
edgesetFormat	No	String	Format of the edge data set. Currently, only the CSV format is supported. The CSV format is used by default.

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Parameter	Mandatory	Type	Description
targetProperties	No	Object	Indicates property information used to distinguish duplicate edges in the edge file, in JSONArray format. For details, see **Table 4-303**.
delimiter	No	Character	Field separator in a CSV file. The default value is comma (,). The default element separator in a field of the list/set type is semicolon (;).
trimQuote	No	Character	Field quote character in a CSV file. The default value is double quotation marks ("). They are used to enclose a field if the field contains separators or line breaks.
obsParameters	Yes	String	OBS authentication parameters. For details, see **Table 4-243**.

Table 4-303 targetProperties parameter description

Parameter	Mandatory	Type	Description
label	Yes	String	Name of a label
properties	Yes	Object	Edge ID properties, in JSONArray format. Currently, only one property is supported.

NOTE

The format of the CSV file for updating properties is as follows:

- Vertex file: Vertex ID
- Edge file (excluding the label): source vertex ID and destination vertex ID
- Edge file (including the label): source vertex ID, destination vertex ID, label, and edge ID

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Response Parameters

Table 4-304 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of an asynchronous job You can view the job execution status and obtain the return result by querying the job ID. For details, see **Querying Job Status on the Service Plane**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
  "jobId": "b4f2e9a0-0439-4edd-a3ad-199bb523b613"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "parameter format error",
  "errorCode": "GES.8013"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.

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Return Value	Description
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.1.19 Granular Permission Control APIs

4.1.19.1 Authorization

Function

GES graph instances support granular permission control. The granularity is refined to the traverse, read, and write permissions set for specific properties of specific labels. The following table describes the GES granular permission control data model. This API is used to grant permissions to a user.

Access	Operation	Object	Graph Instance	Application Scope	Scenario
Grant / Revoke	traverse	LABEL (* indicates all labels.)	Single	-	Vertex: External IDs and label names of vertices can be accessed. Edge: Two vertices have the traverse permission to access the edge ID and label name.
Grant / Revoke	read	PROPERTY (Separate multiple values with commas (,).	Single	Label Name (* indicates all labels)	The traverse permission is required.
Grant / Revoke	write	PROPERTY (Separate multiple values with commas (,).	Single	Label Name (* indicates all labels)	The traverse permission is required.

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Grant / Revoke	schema	GRAPH	Single	graph	Metadata management (modifying property names, clearing schemas, and importing schemas)

NOTE

- The granular permission control APIs are available only when RBAC is enabled for the created graph instance. For details, see **Creating a Graph**. You need to add the **enableRBAC** parameter and set it to **true** when you call the graph creation API.
- To authorize granular permission, you must be a . To call the granular permission APIs, the token obtained for accessing a domain is required..
- Users with the traverse permission can view all vertices and edges with the same label, but cannot view the properties of these vertices and edges.

URI

- URI format
  POST /ges/v1.0/{project_id}/graphs/{graph_name}/rbac/action?action_id=grant
- Parameter description

Table 4-305 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request

- Request example

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/rbac/action?action_id=grant
{

  "userId": "test1",
  "acl": [{
      "type": "read",
      "detail": [{
          "label": "person",
          "properties": ["crime", "Occupation"]
      }, {
          "label": "inmate"
      }]
  }, {
      "type": "write",
      "detail": [{
          "label": "person",
          "properties": ["crime", "Occupation"]
      }, {
```

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```
            "label": "inmate"
        }, {
            "label": "Leader"
        }, {
            "label": "Friend"
        }, {
            "label": "Colleague"
        }, {
            "label": "QQGroup"
        }, {
            "label": "QQ_owner"
        }, {
            "label": "QQ"
        }, {
            "label": "phone"
        }, {
            "label": "Phone_owner"
        }]
    }, {
        "type": "traverse",
        "detail": [{
            "label": "person"
        }, {
            "label": "inmate"
        }, {
            "label": "Leader"
        }, {
            "label": "Friend"
        }, {
            "label": "Colleague"
        }]
    }]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

- Request body parameter description

Table 4-306 Request body parameters

Parameter	Mandatory	Type	Description
graph_name	Yes	String	Graph name
userId	Yes	String	ID of the authorized user.
acl	Yes	JsonArray	Authorization details
type	Yes	String	Permission type. The value can be **read**, **write**, **traverse**, or **schema**.
detail	Yes	JsonArray	Permission details
label	Yes	String	Label name
properties	No	List	Properties

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Response

- Parameter description

  Table 4-307 Parameter description

Parameter	Mandatory	Type	Description
errorMessage	No	String	System prompt. If the execution succeeds, this parameter may be left blank. If the execution fails, this parameter is used to display the error message.
errorCode	No	String	System prompt. If the execution succeeds, this parameter may be left blank. If the execution fails, this parameter is used to display the error code.

- Response example (successful request)

```
Http Status Code: 200
```

- Response example (failed request)

  Status code: 400

  Example response (failed request)

```
Http Status Code: 400
{
   "errorMessage": "grant acl is null",
   "errorCode": "GES.8503"
}
```

Status Code

Response Code	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permissions.
404 Not Found	The requested resource was not found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

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4.1.19.2 Canceling Authorization

Function

This API is used to cancel the authorization.

URI

- URI format
  POST /ges/v1.0/{project_id}/graphs/{graph_name}/rbac/action?action_id=revoke
- Parameter description

Table 4-308 URI parameter description

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request

- Request example

  NOTE

  - **SERVER_URL**: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.
- Request body parameter description

Table 4-309 Request body parameter description

Parameter	Mandatory	Type	Description
graph_name	Yes	String	Graph name
userId	Yes	String	ID of the authorized user.
acl	Yes	JsonArray	Authorization details
type	Yes	String	Permission type. The value can be **read**, **write**, **traverse**, or **schema**.
detail	Yes	JsonArray	Permission details
label	Yes	String	Label name

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Parameter	Mandatory	Type	Description
properties	No	List	Properties

Response

- Parameter description

  Table 4-310 Parameter description

Parameter	Mandatory	Type	Description
errorMessage	No	String	System prompt. If execution succeeds, this parameter may be left blank. If execution fails, this parameter is used to display the error message.
errorCode	No	String	System prompt. If execution succeeds, this parameter may be left blank. If execution fails, this parameter is used to display the error code.

- Response example (successful request)

```
Http Status Code: 200
```

- Response example (failed request)

```
Http Status Code: 400
{
   "errorMessage": "grant acl is null",
   "errorCode": "GES.8503"
}
```

Status Code

Response Code	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permission.
404 Not Found	The requested resource was not found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

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4.1.19.3 Querying Authorization

Function

This API is used to query all label and property permissions of the current user.

URI

- URI format
  GET /ges/v1.0/{project_id}/graphs/{graph_name}/rbac
- Parameter description

Table 4-311 URI parameter description

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request

- Request example
  GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/rbac

  NOTE

  SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Response

```
{
  "data": {
    "acl": [
      {
        "detail": [],
        "type": "traverse"
      },
      {
        "detail": [
          {
            "label": "movie",
            "properties": [
              "movieid",
              "title"
            ]
          },
          {
            "label": "user",
            "properties": [
              "gender",
              "age",
              "userid"
            ]
```

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```
        }
      ],
       "type": "read"
    },
    {
       "detail": [],
       "type": "write"
    }
  ]
 }
}
```

Status Code

Response Code	Description
400 Bad Request	Request error.
401 Unauthorized	Authentication failed.
403 Forbidden	No operation permission.
404 Not Found	The requested resource was not found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	Service unavailable.

Error Code

See **Error Code**.

4.2 Database Edition

4.2.1 Specification Description

As a new graph database product, the database edition provides graph management, graph data addition, deletion, modification, query, and analysis capabilities, supports Cypher, and provides graph data persistence to flush data written by users to disks. In this way, multiple copies and hardware redundancy are used to achieve high availability and fast fault recovery. Currently, the database edition has completed storage and query of hundreds of billions and trillions of graphs.

The following sections describe the APIs supported by database graphs.

Data Types

Type	Description
char	Character
float	Float type (32-bit float)

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Type	Description
double	Double type (64-bit float)
bool	Boolean type. Available values are **0/1** and **true/false**.
long	Long integer (value range: **-2^63** to **2^63–1**)
int	Integer (value range: **-2^31** to **2^31–1**)
date	Date. Currently, the following formats are supported: • YYYY-MM-DD HH:MM:SS • YYYY-MM-DD **NOTE** The value of *MM* or *DD* must consist of two digits. If the value contains only one digit, add 0 before it, for example, **05-01**.
string	Variable-length string

Restrictions on Composite Types

Only the **single** type is supported. **List/set** is not supported.

Data Import Restrictions

There are some restrictions when you import data to a database edition graph:

- Importing data concurrently

  Multiple data files can be imported at the same time. To accelerate the import, split a large file into multiple OBS files that each does not exceed 5 GB.

- Uploading import logs to OBS

  Set the **logDir** parameter to save import logs where you can find the error cause.

- Importing edge data

  If you import only edges of a database edition graph, DLI cannot automatically generate vertices for the graph. If only edges are imported, you cannot query vertices or access the graph from vertices. You are advised to import vertex data too.

4.2.2 Vertex Operation APIs

4.2.2.1 Querying Vertex Details

Function

This API is used to query the vertex information (such as the label and property) based on the vertex ID.

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URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/detail?vertexIds={vertex_ids}

Table 4-312 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
vertex_ids	Yes	String	IDs of the vertices to be queried. You can specify only one vertex ID for a database edition graph.

Request Parameters

Table 4-313 Request body parameter

Parameter	Type	Description
data	List	Vertex details you want to query. For details, see **data parameters**.

Table 4-314 data parameter description

Parameter	Type	Description
vertices	List	Vertex result set. If no corresponding vertices are found, the value of **vertices** is empty.

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Response Parameters

Table 4-315 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Query results.

Example Request

Query node information by node ID and return node details.

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/detail?vertexIds=Ray
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
   "data": {
      "vertices": [
         {
            "id": "Ray",
            "label": "user",
            "properties": {
               "Occupation": [
                  "college/grad student"
               ],
               "Name": [
                  "Lei"
               ],
               "Zip-code": [
                  "90241"
               ],
               "Gender": [
                  "M"
               ],
               "Age": [
                  "18-24"
```

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```
            ]
          }
        }
      ]
    }
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage":"graph [demo] is not found",
 "errorCode":"GES.8204"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.2.2 Querying Vertices in Batches

Function

This API is used to query the vertex data (such as the labels and properties) in batches based on the vertex IDs.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=batch-query

Table 4-316 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

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Parameter	Mandatory	Type	Description
graph_name	Yes	String	Graph name

Request Parameters

Table 4-317 Request body parameter

Parameter	Mandatory	Type	Description
vertices	Yes	String	Vertex IDs you use to query the vertices

Response Parameters

Table 4-318 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	The **data** field is contained when the query is successful, and the **data** field contains the vertices query result.
result	String	Query results. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Query nodes in batches by node ID. The vertex IDs to be queried are **27003509_Station Building** and **39636392_Badaling Great Wall**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=batch-query
{
  "vertices":
```

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```
["27003509_Station Building",
"39636392_Badaling Great Wall"]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
   "data": {
      "vertices": [
         {
            "id": "27003509_Station Building",
            "label": "tag",
            "properties": {
               "popularity": [
                  0
               ],
               "name": [
                  "Station Building"
               ],
               "alias": [
                  "Guanghua Road Office",
                  "Headquarters",
                  "Giant Underpants",
                  "Headquarters Building"
               ]
            }
         },
         {
            "id": "39636392_Badaling Great Wall",
            "label": "tag",
            "properties": {
               "popularity": [
                  0
               ],
               "name": [
                 "Badaling Great Wall"
               ],
               "alias": [
                  "Great Wall"
               ]
            }
         }
      ]
   },
    "result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": " Bad Request, parameter vertices cannot be null",
  "errorCode": "GES.8214"
}
```

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Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.2.3 Adding Vertices in Batches

Function

This API is used to add vertices in batches.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=batch-add

Table 4-319 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Request Parameters

Table 4-320 Request body parameters

Parameter	Mandatory	Type	Description
vertices	Yes	Json	Vertices you want to add. A maximum of 10,000 vertices can be added at a time. For details about this array, see the **vertices parameters**.
overrideExists	No	Boolean	Checks whether the vertex to be inserted exists. The default value is **false**. • If this parameter is set to **false**, an error is reported as long as there is one vertex, and all vertices fail to be written. • If this parameter is set to **true**, the existing vertices are overwritten.

Table 4-321 vertices parameter description

Parameter	Mandatory	Type	Description
vertex	Yes	String	Vertex ID
label	Yes	String	Vertex label
properties	No	Json	Value of each property

Response Parameters

Table 4-322 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.

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Parameter	Type	Description
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Add vertices in batches. The names of the vertices to be added are **150** and **6**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=batch-add
{
   "vertices": [
      {
         "vertex": "150",
         "label": "movie",
         "properties": {
            "movieid": [
               "150"
            ],
            "title": [
               "testmoive"
            ],
            "genres": [
               "Comedy"
            ]
         }
      },
      {
         "vertex": "6",
         "label": "movie",
         "properties": {
            "movieid": [
               "6"
            ],
            "title": [
               "testmoive_exist_id"
            ],
            "genres": [
               "Comedy"
            ]
         }
      }
   ],
   "overrideExists": true
}
```

NOTE

- **SERVER_URL**: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.
- In the example, if vertex **6** already exists in the graph, properties of vertex **6** are overwritten.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
```

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```
"result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
"errorMessage": "vertex [Lily] already exists",
"errorCode": "GES.8000"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.2.4 Deleting Vertices in Batches

Function

This API is used to delete vertices in batches based on the vertex IDs.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=batch-delete

Table 4-323 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Request Parameters

Table 4-324 Request body parameters

Parameter	Mandatory	Type	Description
vertices	Yes	String	Vertex ID array to be deleted

Response Parameters

Table 4-325 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Delete nodes in batches by node ID. The vertex IDs to be deleted are **Vivian** and **46**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/action?action_id=batch-delete
{
   "vertices": [
      "Vivian",
      "46"
   ]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

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Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
    "result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": " Bad Request, parameter vertices cannot be null",
  "errorCode": "GES.8214"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.2.5 Updating Vertex Properties in Batches

Function

This API is used to update vertex properties in batches.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/vertices/properties/action?action_id={actionId}

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Table 4-326 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
actionId	Yes	String	Operator. Possible values: • **batch-update**: Update the value of a property. • **batch-add**: Add the value to a property. When the property's **cardinality** is **single**, the operation is the same as that of **batch-update**. When **cardinality** is **list** or **set**, the operator adds a value to a set. • **batch-del**: Delete a property value.

Request Parameters

Table 4-327 Request body parameters

Parameter	Mandatory	Type	Description
vertices	Yes	Json	Vertex array to be updated For details about this array, see the **vertices parameters**.
ignoreError	No	Boolean	Whether to ignore the update error of specific vertices. The default value is **false**. • The value **false** indicates that if an error that causes the update failure is detected, for example, the vertex to be updated does not exist, an error is reported and no vertex will be updated. • The value **true** indicates that similar errors will be ignored and other vertex properties without errors will be updated.

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Table 4-328 vertices parameter description

Parameter	Mandatory	Type	Description
vertex	Yes	String	Vertex ID
label	No	String	Vertex label
properties	Yes	Json	Value of each property to be updated

Response Parameters

Table 4-329 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Update vertex properties in batches. The vertex names to be updated are **150** and **6**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/vertices/properties/action?
action_id=batch-update
{
   "vertices": [
      {
         "vertex": "150",
         "label": "movie",
         "properties": {
            "movieid": [
               "150"
            ],
            "title": [
               "testmoive"
            ],
            "genres": [
               "Comedy"
            ]
```

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```
        }
      },
      {
         "vertex": "6",
         "properties": {
            "title": [
               "testmoive_exist_id"
            ],
            "genres": [
               "Comedy"
            ]
         }
      }
   ],
      "ignoreError": true

}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage":"vertex [Lily] does not exist",
 "errorCode":"GES.8220"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

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4.2.3 Edge Operation APIs

4.2.3.1 Querying Edge Details

Function

This API is used to query the detailed information about an edge based on the source vertex, target vertex, and index of the edge. Information about edges and properties is returned.

URI

```
GET /ges/v1.0/{project_id}/graphs/{graph_name}/edges/detail?
source={sourceVertex}&target={targetVertex}&label={label}&sortKey={sortKey}&sortKeyType={sortKeyType}
```

Table 4-330 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-331 Request body parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
sourceVertex	Yes	String	Source vertex of an edge
targetVertex	Yes	String	Target vertex of an edge

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Response Parameters

Table 4-332 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Query results. If the query is successful, the query result will be returned. If the query fails, this parameter will be left blank.
result	String	Query result. If the query is successful, the value is **success**. If the query fails, the value is **failed**.

Table 4-333 data parameter description

Parameter	Mandatory	Type	Description
edges	Yes	List	Edge result set. If no edge is found, this parameter will be left blank.

Example Request

Query details about an edge.

```
GET/ges/v1.0/{project_id}/graphs/{graph_name}/edges/detail?
source=46&&target=39&&label=rate&&sortKey=5&&sortKeyType=int
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
{
   "data": {
```

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```
      "edges": [
         {
            "source": "46",
            "target": "39",
            "label": "rate",
            "sortKey": 5,
            "properties": {
               "Rating": [
                  5
               ],
               "Datetime": [
                  "2018-01-0120:30:05"
               ]
            }
         }
      ]
   },
   "result": "success"
}
```


Status code: 400

Example response for a failed request


```
Http Status Code: 400
{
"errorMessage":"graph [demo] is not found",
"errorCode":"GES.8107"
}
```


Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.3.2 Querying Edges in Batches

Function

This API is used to query the detailed information about edges in batches based on the source vertices, target vertices, and indexes of the edges. Information about edges and properties is returned.

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URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=batch-query

Table 4-334 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-335 Request body parameter

Parameter	Mandatory	Type	Description
edges	Yes	Object	Edge array to be queried

Table 4-336 edges parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Source vertex of an edge
target	Yes	String	Target vertex of an edge

Response Parameters

Table 4-337 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.

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Parameter	Type	Description
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	String	The **data** field is contained when the query is successful, and the **data** field contains the edges query result.

Example Request

Query details about edges in batches based on the source vertex, target vertex, and index. The source vertex of the edges to be queried is **Vivian**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=batch-query
{
   "edges": [
        {
           "source": "Vivian",
           "target": "Lethal Weapon",
           "label": "rate"
        },
        {
           "source": "Vivian",
           "target": "Raising Arizona"
        }
    ]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
{
   "data": {
      "edges": [
         {
            "source": "Vivian",
            "target": "Raising Arizona",
            "label": "rate",
            "properties": {
               "Score": [
                  4
               ],
               "Datetime": [
                  "2000-12-27 23:51:42"
               ]
            }
        },
        {
```

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```
            "source": "Vivian",
            "target": "Lethal Weapon",
            "label": "rate",
            "properties": {
                "Score": [
                    5
                ],
                "Datetime": [
                    "2000-12-27 23:44:41"
                ]
            }
        }
    ]
  },
  "result": "success"
}
```


Status code: 400

Example response for a failed request


```
Http Status Code: 400
{
 "errorMessage":"parameter does not contain 'source'",
 "errorCode":"GES.8000"
}
```


Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.3.3 Adding Edges in Batches

Function

This API is used to add edges in batches.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=batch-add

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Table 4-338 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Parameter	Mandatory	Type	Description
edges	Yes	Object	Edge array to be added
parallelEdge	No	Object	How to process repetitive edges
action	No	String	Processing mode. The value can be **override** or **ignore**. • If the value is **override**, the previous repetitive edges are overwritten. • If the value is **ignore** and an edge already exists, the previous edge will not be overwritten. If no edge exists, the system adds an edge.
ignoreLabel	No	Boolean	Whether to ignore labels on repetitive edges. The value can only be **false**. **false**: Edges with the same source vertex, target vertex, and label are duplicate edges.
createNotExists	No	Boolean	Whether to add source or target vertices that do not exist in the **edges** parameter before adding edges. The value can only be **false**. **false**: Edges can be added regardless of whether the source or target vertex exists.

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Table 4-339 edges parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Source vertex of an edge
target	Yes	String	Target vertex of an edge
label	Yes	String	Edge label
properties	No	Object	Value of each property

Response Parameters

Table 4-340 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Add edges in batches. The source vertex is **46**, the target vertices are **39** and **38**, and the edge label is **rate**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=batch-add
{
   "edges": [
      {
         "source": "46",
         "target": "39",
         "label": "rate",
         "properties": {
            "Rating": [
               5
            ],
            "Datetime": [
               "2018-01-0120:30:05"
            ]
```

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```
            }
        },
        {
            "source": "46",
            "target": "38",
            "label": "rate",
            "properties": {
                "Rating": [
                    4
                ],
                "Datetime": [
                    "2018-01-0120:30:05"
                ]
            }
        }
    ],
    "parallelEdge": {
        "action": "override",
        "ignoreLabel": false
    },
    "createNotExists": false
}
```

NOTE

- **SERVER_URL**: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.
- In the example, if vertices **666** and **777** are not in the original graph, create vertices **666** and **777**, retain the default value of each label, and add an edge.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
 "result":"success",
 "data": {
    "edges": [
        {
            "index": "7",
            "source": "46",
            "target": "39"
        },
        {
            "index": "0",
            "source": "46",
            "target": "38"
        }
    ]
 }
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage":"edge source vertex [Lily] does not exist",
 "errorCode":"GES.8000"
}
```

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Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.3.4 Deleting Edges in Batches

Function

This API is used to delete edges in batches based on the source vertices, target vertices, and indexes of the edges.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=batch-delete

Table 4-341 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Example Request

Delete edges in batches. The source vertices of the edges are **39631050_Landscape** and **27803870_Landmark building**, and the target vertices of the edges are **27803870_Landmark building** and **27661363_Villa hot spring**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/action?action_id=batch-delete
{
   "edges": [
```

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```
    {
          "source": "39631050_Landscape",
          "target": "27803870_ Landmark building"
    },
    {
       "index": "0",
          "source": "27803870_Landmark building",
       "target": "27661363_Villa hot spring"
    }
  ],
  "ignoreError": true
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Request Parameters

Table 4-342 Request body parameters

Parameter	Mandatory	Type	Description
edges	Yes	Object	Edge array to be deleted
executionMode	No	String	**sync** indicates the synchronous mode, and **async** indicates the asynchronous mode. The default value is **sync**.
ignoreError	No	Boolean	Whether to ignore errors, for example, the edge to delete does not exist. The default value is **false**, indicating that errors will not be ignored. Errors in JSON format cannot be ignored.

Table 4-343 edges parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Source vertex of an edge
target	Yes	String	Target vertex of an edge
index	No	String	Edge index

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Parameter	Mandatory	Type	Description
label	No	String	Label of an edge. If the **index** parameter is set, this parameter is ignored. If the **index** parameter is not set, an edge that meets the **source**, **target**, and **label** conditions is deleted. If the specified **label** value does not exist in the schema or the edge with the same **label** does not exist, no edge will be deleted.

Response Parameters

- Synchronous call

Table 4-344 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage":"parameter does not contain 'source'",
 "errorCode":"GES.8000"
}
```

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- Asynchronous call

Table 4-345 Response body parameters

Parameter	Mandatory	Type	Description
errorMessage	No	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	No	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	No	String	ID of the deletion job. This parameter is left blank when the request fails. This ID can be used as a request parameter to obtain the deletion result through the API for querying the job status.
jobType	No	Integer	Job type. This parameter is left blank when the request fails.

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"jobId": "500dea8f-9651-41fe-8299-c20f13a032ea",
"jobType": 3
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
"errorMessage": "graph [test_117d] is not found",
"errorCode": "GES.8402"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.

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Return Value	Description
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.3.5 Updating Edge Properties in Batches

Function

This API is used to update edge properties in batches.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/edges/properties/action?action_id={actionId}

Table 4-346 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
actionId	Yes	String	Operator. Possible values: • **batch-update**: Update the value of a property. • **batch-add**: Add the value to a property. When the property's **cardinality** is **single**, the operation is the same as that of **batch-update**. When **cardinality** is **list** or **set**, the operator adds a value to a set. • **batch-del**: Delete a property value.

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Request Parameters

Table 4-347 Request body parameters

Parameter	Mandatory	Type	Description
edges	Yes	Json	Edge array to be updated
ignoreError	No	Boolean	Whether to ignore the update error of specific edges. The default value is **false**. • If the value is **false**, an error that causes the update failure is detected. For example, if the edge to be updated does not exist, an error is reported and no edge is updated. • If the value is **true**, similar errors are ignored and other edge properties without errors are updated.

Table 4-348 edges parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Source vertex of an edge
target	Yes	String	Target vertex of an edge
label	No	String	Edge label
properties	Yes	Object	Value of each property

Response Parameters

Table 4-349 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.

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Parameter	Type	Description
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Update edge properties in batches. The source vertex of the edge is **46**, and the target vertices of the edge are **39** and **38**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/edges/properties/action?
action_id=batch-update
{
   "edges": [
      {
         "source": "46",
         "target": "39",
         "properties": {
            "Rating": [
               5
            ],
            "Datetime": [
               "2018-01-0120:30:05"
            ]
         }
      },
      {
         "source": "46",
         "target": "38",
         "index": "0",
         "properties": {
            "Rating": [
               4
            ],
            "Datetime": [
               "2018-01-0120:30:05"
            ]
         }
      }
   ],
      "ignoreError": true
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

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```
Http Status Code: 200
{
 "result":"success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
 "errorMessage":"edge source vertex [46] does not exist",
 "errorCode":"GES.8221"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.4 Metadata Operation APIs

4.2.4.1 Adding a Label

Function

This API is used to add a label.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/schema/labels

Table 4-350 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

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Parameter	Mandatory	Type	Description
graph_name	Yes	String	Graph name

Request Parameters

- Request parameters (OBS scenario)

Table 4-351 Request body parameters

Parameter	Mandatory	Type	Description
name	Yes	String	Name of a label A label name can contain a maximum of 256 characters. Only letters, digits, spaces, and special characters %,@,#,$,:,?,*, .,+,- are allowed.
type	No	String	Label type, indicating that the label is used for vertices or edges. The options are as follows: • **vertex**: indicates that the label is used for vertices. • **edge**: indicates that the label is used for edges. • **all**: indicates that the label is used for vertices and edges. The default value is **all**.
properties	Yes	Object	Properties you want to add to the label. For details about the parameters, see **Table 4-352**.

Table 4-352 properties parameter description

Parameter	Mandatory	Type	Description
property	No	Object	Label properties. For details about the parameters, see **Table 4-353**.

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Table 4-353 property parameters

Parameter	Mandatory	Type	Description
name	Yes	String	Property name 1. A property name can contain a maximum of 256 characters. 2. A property name cannot contain <, >, &, ASCII 14,15 or 30. 3. The property under a label must be unique.
cardinality	Yes	String	Composite type of a property. Currently, only **single** is supported.
dataType	Yes	String	Data type of a property. For details, see the metadata types in **Specification Description**.

Response Parameters

Table 4-354 Parameter description

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

Example Request

Add a label. The label name is **book**. The label has one property to add.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/schema/labels
{
  "name": "book",
  "type": "vertex",
  "properties": [
```

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```
  {
    "property": {
      "name": "Title",
      "cardinality": "single",
      "dataType": "string"
    }
  },
  {
    "property": {
      "name": "Version",
      "cardinality": "single",
      "dataType": "string"
    }
  }
 ]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
 "result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
 {
  "errorMessage": "label already exists",
  "errorCode": "GES.8801"
 }
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

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4.2.4.2 Updating a Label

Function

In the current version, this API can only add properties to the end of existing labels, but cannot delete existing properties or update the property sequence.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/schema?label={labelName}

Table 4-355 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
label_name	Yes	String	Label name

Request Parameters

Table 4-356 Request body parameters

Parameter	Mandatory	Type	Description
type	No	String	Label type, indicating that the label is used for vertices or edges. The options are as follows: • **vertex**: indicates that the label is used for vertices. • **edge**: indicates that the label is used for edges. • **all**: indicates that the label is used for vertices and edges. The default value is **all**.
properties	Yes	Object	Property array to be appended. **Table 4-357** describes the parameters in an array.

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Table 4-357 properties parameter description

Parameter	Mandatory	Type	Description
property	No	Object	Label properties. For details about the parameters, see **Table 4-358**.

Table 4-358 property parameters

Parameter	Mandatory	Type	Description
name	Yes	String	Property name 1. A property name can contain a maximum of 256 characters. 2. A property name cannot contain <, >, &, ASCCI 14,15 and 30. 3. The property under a label must be unique.
cardinality	Yes	String	Composite type of a property. Currently, only **single** is supported.
dataType	Yes	String	Data type of a property. For details, see the metadata types in **Specification Description**.

Response Parameters

Table 4-359 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Request result. If the request is successful, the value is **success**. If the request fails, the value is **failed**.

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Example Request

Update a label. The label name is **book**. The label has one property to update.

```
POST /ges/v1.0/{project_id}/graphs/{graph_name}/schema?label={labelName}
{
  "type": "vertex",
  "properties": [
    {
      "property": {
        "name": "Title",
        "cardinality": "single",
        "dataType": "string"
      }
    },
    {
      "property": {
        "name": "Version",
        "cardinality": "single",
        "dataType": "string"
      }
    }
  ]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
 "result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
 {
  "errorMessage": "label already exists",
  "errorCode": "GES.8801"
 }
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.

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Return Value	Description
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.4.3 Querying Graph Metadata Details

Function

This API is used to query graph metadata details.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/schema

Table 4-360 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Response Parameters

Table 4-361 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.

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Parameter	Type	Description
data	Object	Query results. This parameter is left blank when the request fails.

Table 4-362 data parameter description

Parameter	Type	Description
schema	List	Definition of each label and their associated property fields

Table 4-363 schema parameter description

Parameter	Type	Description
label	String	label name
properties	Object	Property array. For details, see **properties parameter description**.
type	String	Label type, indicating that the label is used for vertices or edges.

Table 4-364 properties parameter description

Parameter	Type	Description
name	String	Property name 1. A property name can contain a maximum of 256 characters. 2. A property name cannot contain <, >, &, ASCII 14, 15, or 30. 3. The property under a label must be unique.
cardinality	String	Composite type of a property. Currently, only **single** is supported.
dataType	String	Data type of a property. For details, see the metadata types in **Specification Description**.

Example Request

Query metadata details of a graph.

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/schema
```

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NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request


```
Http Status Code: 200
{
   "data": {
      "schema": [
         {
            "label": "__DEFAULT__",
            "type": "all"
         },
         {
            "label": "friends",
            "type": "vertex"
         },
         {
            "label": "movie",
            "type": "vertex",
            "properties": [
               {
                  "name": "ChineseTitle",
                  "type": "string",
                  "cardinality": "single"
               },
               {
                  "name": "Year",
                  "type": "int",
                  "cardinality": "single"
               }
            ]
         },
         {
            "label": "user",
            "type": "vertex",
            "properties": [
               {
                  "name": "Name",
                  "type": "string",
                  "cardinality": "single"
               },
{
                  "name": "Occupation",
                  "type": "string",
                  "cardinality": "single"
               },
               {
                  "name": "Zip-code",
                  "type": "char array",
                  "cardinality": "single
"
               }
            ]
         },
         {
            "label": "rate",
            "type": "edge",
            "properties": [
               {
                  "name": "Score",
                  "type": "int",
```


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```
                "cardinality": "single"
            },
            {
                "name": "Datetime",
                "type": "date",
                "cardinality": "single"
            }
        ]
    }
  ]
 }
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "graph [demo] is not found",
  "errorCode": "GES.8003"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.5 Index Operation APIs

4.2.5.1 Creating an Index

Function

This API is used to create indexes based on the specified information such as indexName and IndexType. Currently, GES supports composite indexes.

- Composite indexes include **GlobalCompositeVertexIndex**, **GlobalCompositeEdgeIndex**, **CompositeVertexIndex**, and **CompositeEdgeIndex**. A composite index is created for a fixed combination of properties. A local index can be created on a specified label. You do not need to specify a label for a global composite index. As long as a label

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contains a specified property, an index is automatically created on the label. Indexes can be used to accelerate queries.

Indexes

Feature	Fuzzy Search	Speed	Flexibility
Composite indexes	No	Fast	Fixed composite property keys only

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/indices

Table 4-365 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-366 Request body parameters

Parameter	Mandatory	Type	Description
indexName	Yes	String	Index name. The name can contain a maximum of 63 characters. Only letters, digits, hyphens (-), and underscores (_) are allowed.
indexType	Yes	String	Index type, which is case sensitive • **GlobalCompositeVertexIndex** is a global composite vertex index. • **GlobalCompositeEdgeIndex** is a global composite edge index. • **CompositeVertexIndex** is a local composite vertex index. • **CompositeEdgeIndex** is a local composite edge index. • **FullTextIndex** is a full-text index.

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Parameter	Mandatory	Type	Description
indexLabel	No	List	Labels on which indexes are created. This parameter is available only when **indexType** is set to **CompositeVertexIndex** or **CompositeEdgeIndex**. This parameter is mandatory.
indexProperty	No (If **hasLabel** is **false** or **null**, this parameter is mandatory.)	List	Index property list Indexes can be created for the following property types: **integer**, **float**, **double**, **long**, **enum**, **char array**, **string**, and **date**.

NOTE

- If a property is of the string or char array type, the value must be no more than 40 bytes. The excess part will be deleted.
- Cypher queries can be accelerated with indexes whose **hasLabel** is **True**.
  - If **indexProperty** is left blank, the created index is a label index, which accelerates label filtering.
  - If **indexProperty** is specified, the created index is a property index, which accelerates property filtering.

Response Parameters

Table 4-367 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.

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Parameter	Type	Description
jobId	String	ID of an asynchronous job **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.
jobType	String	Type of an asynchronous job
result	String	If the execution is successful, the value of **result** is **success**.

Example Request

Create a composite index. The index name is **ageIndex** and the index type is global vertex index.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/indices
{
    "indexName":"ageIndex",
    "indexType": "GlobalCompositeVertexIndex",

    "hasLabel": "true",
    "indexProperty": ["age"]
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"jobId": "f99f60f1-bba6-4cde-bd1a-ff4bdd1fd500000168232",
"jobType": 8
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "graph [demo] is not found",
  "errorCode": "GES.8603"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.

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Return Value	Description
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.5.2 Deleting an Index

Function

This API is used to delete an index based on the specified indexName.

URI

DELETE /ges/v1.0/{project_id}/graphs/{graph_name}/indices/{indexName}

Table 4-368 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
indexName	Yes	String	Index name

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Response Parameters

Table 4-369 Parameter description

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobType	String	Type of an asynchronous job

Example Request

Delete an index by name. The index name is **ageIndex**.

```
DELETE http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/indices/ageIndex
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
  "jobId": "fb74314e-a82d-41b2-8900-96e2559fa0d9000168232",
  "jobType": 9
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "graph [demo] is not found",
  "errorCode": "GES.8604 "
}
```

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Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.5.3 Querying Indexes

Function

This API is used to query all indexes created on a graph.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/indices

Table 4-370 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

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Response Parameters

Table 4-371 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
data	Object	Index data you want to query
result	String	Query results. If the query is successful, **success** is displayed.
indices	List	Indexes
indexType	String	Index types
indexName	String	Index names
indexLabel	List	Labels of local indexes
indexProperty	List	Index properties

Example Request

Query all indexes created on a graph.

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/indices
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
  "data": {
    "indices": [
      {
        "indexType": "GlobalCompositeVertexIndex",
        "indexName": "ageIndx",
```

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```
      "indexProperty": [
        "age"
      ],
      "hasLabel": true

    }
  ]
 },
  "result": "success"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "graph [demo] is not found",
  "errorCode": "GES.8605"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.5.4 Creating Indexes in Batches

Function

This API is used to create indexes in batches. By doing so, the number of data scans is reduced and the overall time required is shorten. The types of indexes that can be created are the same as those of the index creation API. For details, see **Creating an Index**.

NOTE

After an index is created, wait for 30 seconds for index synchronization. After the synchronization is complete, Cypher queries can be accelerated using the index.

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URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/indices/action?action_id=batch-build

Table 4-372 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-373 Request body parameter

Parameter	Mandatory	Type	Description
indices	Yes	Array	Index array. The number of new indexes cannot exceed the maximum number of supported indexes minus the number of existing indexes. Currently, a maximum of 10 indexes can be created. For details about index parameters, see **Table 4-374**.

Table 4-374 indices parameter description

Parameter	Mandatory	Type	Description
indexName	Yes	String	Index name. The name can contain a maximum of 63 characters. Only letters, digits, hyphens (-), and underscores (_) are allowed.

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Parameter	Mandatory	Type	Description
indexType	Yes	String	Index type, which is case sensitive • **GlobalCompositeVertexIndex** is a global composite vertex index. • **GlobalCompositeEdgeIndex** is a global composite edge index. • **CompositeVertexIndex** is a local composite vertex index. • **CompositeEdgeIndex** is a local composite edge index. • **FullTextIndex** is a full-text index.
indexLabel	No	List	Labels on which indexes are created. This parameter is available only when **indexType** is set to **CompositeVertexIndex** or **CompositeEdgeIndex**. This parameter is mandatory.
indexProperty	No (If **hasLabel** is **false** or **null**, this parameter is mandatory.)	String	Index property list Indexes can be created for the following property types: **integer**, **float**, **double**, **long**, **enum**, **char array**, **string**, and **date**.

NOTE

- If a property is of the string or char array type, the value must be no more than 40 bytes. The excess part will be deleted.
- Cypher queries can be accelerated with indexes whose **hasLabel** is **True**.
  - If **indexProperty** is left blank, the created index is a label index, which accelerates label filtering.
  - If **indexProperty** is specified, the created index is a property index, which accelerates property filtering.

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Response Parameters

Table 4-375 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt code • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of an asynchronous job **NOTE** • You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.
jobType	String	Type of an asynchronous job
result	String	If the execution is successful, the value is **success**.

Example Request

Create multiple composite indexes at a time. The index names are **vertexIndex**, **edgeIndex**, and **useridIndex**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/indices/action?action_id=batch-build
{
   "indices": [
      {
         "indexName": "vertexIndex",
         "indexType": "GlobalCompositeVertexIndex",
         "hasLabel": true,
         "indexProperty": []
      },
      {
         "indexName": "edgeIndex",
         "indexType": "GlobalCompositeEdgeIndex",
         "hasLabel": true,
         "indexProperty": []
      },
   {
         "indexName": "useridIndex",
         "indexType": "GlobalCompositeEdgeIndex",
         "hasLabel": true,
         "indexProperty": ["userid"]
      }
   ]
}
```

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NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"jobId": "f99f60f1-bba6-4cde-bd1a-ff4bdd1fd500000168232",
"jobType": 8
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorMessage": "graph [demo] is not found",
  "errorCode": "GES.8603"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes for Service Plane APIs**.

4.2.6 Native Algorithm APIs

4.2.6.1 Running Algorithms

Function

This API is used to run specified algorithms based on entered parameters.

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URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-algorithm

Table 4-376 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Example Request

Execute a specified algorithm. The algorithm name is **pagerank**, the weight coefficient is **0.85**, the convergence precision is **0.00001**, the maximum number of iterations is **1000**, and traversal is performed along edge directions.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-algorithm
{
 "algorithmName":"pagerank",
 "parameters":{
        "alpha":0.85,
        "convergence":0.00001,
        "max_iterations":1000,
        "directed":true
 }
}
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Request Parameters

For details about the parameters, see **Common algorithm parameters**.

Response Parameters

Table 4-377 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.

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Parameter	Type	Description
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of the algorithm execution job. This parameter is left blank when the request fails. **NOTE** You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.
jobType	Integer	Job type. This parameter is left blank when the request fails.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"jobId": "4448c9fb-0b16-4a78-8d89-2a137c53454a001679122",
"jobType": 1
}
```

Status code: 4200

Example response for a failed request

```
Http Status Code: 400
{
"errorMessage":"graph [demo] is not found",
"errorCode":"GES.8402"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

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Error Codes

See **Error Codes**.

4.2.6.2 Algorithm API Parameter References

4.2.6.2.1 Common Algorithm Parameters

Request Example

```
{
 "algorithmName":"XXX",
 "parameters":{
        ...
 }
}
```

Request Parameters

Table 4-378 Request body parameters

Parameter	Mandatory	Type	Description
algorithmName	Yes	String	Algorithm name. Available values are as follows (algorithm names you can call): • shortest_path • shortest_path_of_vertex_sets • common_neighbors_of_vertex_sets
parameters	Yes	Object	Algorithm parameters. For details, see the parameter description of each algorithm.

Table 4-379 New Body parameters of version 2.1.7

Parameter	Mandatory	Type	Description
executionMode	No	String	• **sync**: synchronous • **async**: asynchronous The default value is **async**. Supported algorithms are as follows (algorithm names you can call): • shortest_path • shortest_path_of_vertex_sets

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Parameter	Mandatory	Type	Description
offset	No	Integer	Synchronization result offset. The default value is **0**. **NOTE** This parameter is available when **executionMode** is **sync**. Supported algorithms are as follows (algorithm names you can call): • k_hop • shortest_path • all_shortest_paths • shortest_path_of_vertex_sets • n_paths • realtime_recommendation • filtered_all_pairs_shortest_paths • filtered_all_shortest_paths
limit	No	Integer	Maximum number of returned synchronization results. The maximum value is **100000**. The default value is **100000**. **NOTE** This parameter is available when **executionMode** is **sync**. Supported algorithms are as follows (algorithm names you can call): • k_hop • shortest_path • all_shortest_paths • shortest_path_of_vertex_sets • n_paths • realtime_recommendation • filtered_all_pairs_shortest_paths • filtered_all_shortest_paths

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Table 4-380 New Body parameters of version 2.2.4

Parameter	Mandatory	Type	Description
vertex_filter	No	Object	Filter criteria for the vertices on a path. Supported algorithms are as follows (algorithm names you can call): • filtered_shortest_path • filtered_all_pairs_shortest_paths • filtered_all_shortest_paths For details about the format, see **Table 4-274** in "Filtered-query API."
edge_filter	No	Object	Filter criteria for the edges (relationships) on a path. Supported algorithms are as follows (algorithm names you can call): • filtered_shortest_path • filtered_all_pairs_shortest_paths • filtered_all_shortest_paths For details about the format, see **Table 4-274** in "Filtered-query API."
filters	No	Object	Filter criteria. Each element in the array corresponds to a filter. This parameter applies only to filtered circle detection. For details about the format, see **filters element formats**. Supported algorithms: • filtered_n_paths

Example Response

Algorithms are executed based on input parameters. You can call **Querying Job Status and Execution Results** to use the **job_id** returned by the algorithm to obtain the algorithm execution result.

Status code: 200

Example response for a successful request

```
{
   "data": {

  "outputs": {
        $response_data //Result of each algorithm. The results vary with the algorithm.
        "runtime": 1.365867,
        "data_return_size": 3,
        "data_offset": 0,
        "data_total_size": 100
   }
```

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```
  },
  "status": "complete"
}
```

NOTE

response_data indicates the result of each algorithm. The results vary with algorithms.

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
"errorMessage":"Running algorithm [XXXX] error: YYYYYYYYY!",
"errorCode":"GES.8301"
}
```

Response Parameters

Table 4-381 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. If execution succeeds, this parameter may be left blank. If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. If execution succeeds, this parameter may be left blank. If execution fails, this parameter is used to display the error code.
status	String	Returned job status for a successful query. Possible values are **waiting**, **running**, and **complete**. This parameter is left blank when the query fails.
data	Object	Algorithm execution result. This parameter is left blank when the query fails.

4.2.6.2.2 Shortest Path

Table 4-382 parameters parameter description

Parameter	Mandatory	Type	Description
source	Yes	String	Source vertex ID of a path
target	Yes	String	Target vertex ID of a path
directed	No	Boolean	Whether to consider the edge direction. The value is **true**.

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Parameter	Mandatory	Type	Description
timeWindow	No	Object	Time window for time filtering. For details, see **Table 4-383**. **NOTE** **timeWindow** does not support the shortest path with weight. That is, parameters **timeWindow** and **weight** cannot be both specified.

Table 4-383 timeWindow parameter description

Parameter	Mandatory	Type	Description
filterName	Yes	String	Character string: The property on the corresponding vertex/edge is used as the time.
filterType	No	String	Filters vertices or edges. The default value is **BOTH**. • **V**: filtering by vertex • **E**: filtering by edge • **BOTH**: filtering by vertex and edge
startTime	No	String	Start time, which is a string of the date type or a timestamp.
endTime	No	String	End time, which is a string of the date type or a timestamp.

Table 4-384 response_data parameter description

Parameter	Type	Description
path	List	Shortest path. The format is as follows: [vertexId,...] where **vertexId** is of the string type.
source	String	Source vertex ID
target	String	Target vertex ID

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4.2.6.2.3 Shortest Path of Vertex Set

Table 4-385 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
sources	Yes	Source vertex ID set	String	The value is in the standard CSV format. IDs are separated by commas (,), for example, **Alice, Nana**. The maximum ID number is 100000.	-
targets	Yes	Target vertex ID set	String	The value is in the standard CSV format. IDs are separated by commas (,), for example, **Alice, Nana**. The maximum ID number is 100000.	-
directed	No	Whether an edge is directed	Boolean	**true** or **false**	false
timeWindow	No	Time window used for time filtering	Object	For details, see **Table 4-386**.	-

Table 4-386 timeWindow parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
filterName	No	Name of the time property used for time filtering	String	Character string: The property on the corresponding vertex/ edge is used as the time.	-

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Parameter	Mandatory	Description	Type	Value Range	Default Value
filterType	No	Filtering by vertex or edge	String	**V**: filtering by vertex **E**: filtering by edge **BOTH**: filtering by vertex and edge	BOTH
startTime	No	Start time	String	Date character string or timestamp	-
endTime	No	End time	String	Date character string or timestamp	-

Table 4-387 response_data parameter description

Parameter	Type	Description
path	List	Shortest path. The format is as follows: [vertexId,...] where **vertexId** is of the string type.
source	String	Source vertex ID
target	String	Target vertex ID

4.2.6.2.4 Common Neighbors of Vertex Sets

Table 4-388 parameters parameter description

Parameter	Mandatory	Description	Type	Value Range	Default Value
sources (2.2.6)	Yes	Source vertex ID set	String	The value is in the standard CSV format. IDs are separated by commas (,), for example, **Alice, Nana**. The maximum ID number is 100000.	-

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Parameter	Mandatory	Description	Type	Value Range	Default Value
targets (2.2.6)	Yes	Target vertex ID set	String	The value is in the standard CSV format. IDs are separated by commas (,), for example, **Mike,Amy**. The maximum ID number is 100000.	-
restricted (2.2.13)	No	Whether other constraints are included	Boolean	**true** or **false** • **false**: There is no additional constraint. The found common neighbors are the intersection of the neighborhoods corresponding to the source vertex set and target vertex set. • **true**: There are additional constraints. The found common neighbors are not only the intersection of the neighborhoods corresponding to the source vertex set and target vertex set, but each vertex in the common neighbor set has at least two neighboring vertices in the source vertex set and target vertex set.	true

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Table 4-389 response_data parameter description

Parameter	Type	Description
vertices	List	Common neighbor vertices. The format is as follows: [vertexId,...], where **vertexId** is of the string type.
common_neighbors	Integer	Number of common neighbors

4.2.7 Graph Statistics APIs

4.2.7.1 Querying General Information About a Graph

Function

This API is used to query the general information about a graph, such as the numbers of vertices and edges.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/summary?label_details={labelDetails}

Table 4-390 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name
labelDetails	No	Boolean	Whether to return the number of vertices and edges under each label. The default value is **false**. If this parameter is set to **true**, the numbers of vertices and edges under each label are returned.

Example Request

Query general information about a graph, such as the numbers of vertices and edges. The value **true** indicates that the numbers of vertices and edges of different labels are returned.

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```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/summary?label_details=true
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Response Parameters

Table 4-391 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of an asynchronous job You can view the job execution status and obtain the return result by querying the job ID. For details, see **Querying Job Status on the Service Plane**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"jobId": "f99f60f1-bba6-4cde-bd1a-ff4bdd1fd500000168232"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
    "errorMessage": "graph [demo] is not found",
    "errorCode": "GES.8001"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.

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Return Value	Description
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.7.2 Querying the Graph Version

Function

This API is used to query the graph version.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/version

Table 4-392 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

None

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Response Parameters

Table 4-393 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
version	String	Query results. This parameter is left blank when the request fails.

Example Request

Query the graph version.

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/version
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
    "version":"2.0.0"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 404
{
  "errorMessage":"Not found. Please check the input parameters.",
  "errorCode": "GES.8000"
}
```

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Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.8 Graph Operation APIs

4.2.8.1 Importing a Graph

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=import-graph

Table 4-394 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Request Parameters

Table 4-395 Request body parameters

Parameter	Mandatory	Type	Description
edgesetPath	No	String	Edge file directory or name

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Parameter	Mandatory	Type	Description
edgesetFormat	No	String	Format of the edge data set. Currently, only the CSV format is supported. The CSV format is used by default.
vertexsetPath	No	String	Vertex file directory or name
vertexsetFormat	No	String	Format of the vertex data set. Currently, only the CSV format is supported. The CSV format is used by default.
schemaPath	No	String	OBS path of the metadata file of the new data
logDir	No	String	Directory for storing logs of imported graphs. This directory stores the data that fails to be imported during graph creation and detailed error causes.
parallelEdge	No	Object	How to process repetitive edges.
action	No	String	Processing method. The value is **override**, which indicates that the previous repetitive edges are overwritten.
ignoreLabel	No	Boolean	Whether to ignore labels on repetitive edges. The value is **false**. **false**: Indicates that the repetitive edge definition contains the label. That is, the <source vertex, target vertex, label> indicates an edge.
delimiter	No	Character	Field separator in a CSV file. The default value is comma (,). The default element separator in a field of the list/set type is semicolon (;).
trimQuote	No	Character	Field quote character in a CSV file. The default value is double quotation marks ("). They are used to enclose a field if the field contains separators or line breaks.

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Parameter	Mandatory	Type	Description
offline	No	Boolean	Whether to import a graph offline. The value is **false**. **false**: Online import is selected. Compared with offline import, online import is slower. However, the graph can be read (cannot be written) during the import.
obsParameters	Yes	Object	OBS parameters

Table 4-396 parallelEdge parameter type

Parameter	Mandatory	Type	Description
sortKeyColumn	No	Int/String	Index of the sort key column in the edge file. The value starts from 1. If this parameter is set to **last Column**, the sort key column is the last column. The options are as follows: • A positive integer • A positive integer of the string type • **"lastColumn"**
sortKeyType	No	String	Type of the sortKey value. The options are **int** and **string**.

Table 4-397 obsParameters parameters

Parameter	Mandatory	Type	Description
accessKey	Yes	String	User AK
secretKey	Yes	String	User SK

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Response Parameters

Table 4-398 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of an asynchronous job You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.

Example Request

Import a graph. The edge file directory is **testbucket/demo_movie/edges/** and the edge data set format is CSV; the vertex file directory is **testbucket/demo_movie/vertices/** and the vertex data set format is CSV; the OBS path of the metadata file of the new data is **testbucket/demo_movie/incremental_data_schema.xml** and the log storage directory is **testbucket/importlogdir**.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=import-graph
{
  "edgesetPath": "testbucket/demo_movie/edges/",
  "edgesetFormat": "csv",
  "vertexsetPath": "testbucket/demo_movie/vertices/",
  "vertexsetFormat": "csv",
  "schemaPath": "testbucket/demo_movie/incremental_data_schema.xml",
  "logDir": "testbucket/importlogdir",
  "parallelEdge": {
          "action":"override",
          "ignoreLabel":true
   },
  "delimiter": ",",
  "trimQuote": "\"",
  "offline": true,
  "obsParameters": {
    "accessKey": "xxxxxx",
    "secretKey": "xxxxxx"
  }

}
```

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Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"jobId": "b4f2e9a0-0439-4edd-a3ad-199bb523b613"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorCode": "GES.8013",
  "errorMessage": "graph [movie2] is not found"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.8.2 Clearing a Graph

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=clear-graph

Table 4-399 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.

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Parameter	Mandatory	Type	Description
graph_name	Yes	String	Graph name

Request Parameters

Table 4-400 Request body parameter

Parameter	Mandatory	Type	Description
clearMetadata	No	Boolean	Whether to clear schema data. The default value is **false**.

Response Parameters

Table 4-401 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
jobId	String	ID of an asynchronous job You can view the job execution status and obtain the return result by querying the job ID. For details, see **Job Management APIs**.

Example Request

Clear a graph by deleting its schema data.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=clear-graph
{
	"clearMetadata": true
}
```

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Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
"jobId": "b4f2e9a0-0439-4edd-a3ad-199bb523b613"
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "errorCode": "GES.8012",
  "errorMessage": "graph [movie2] is not found"
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.9 Job Management APIs

4.2.9.1 Querying the Job List

Function

After the ID of an asynchronous job is returned, if the job ID at the service layer is lost and cannot be obtained through the API, a new API is provided to query all asynchronous jobs stored in the engine. The job ID, job status, and original request of each job are returned.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/jobs/status?limit={limit}&offset={offset}

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Table 4-402 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
job_id	Yes	String	ID of the job corresponding to the response

Request Parameters

For details, see the URI parameters.

Response Parameters

Table 4-403 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
result	String	Query result. If the query is successful, the value is **success**. If the query fails, the value is **failed**.
jobs	Object	Job status list stored in the system. If execution succeeds, this parameter is contained in the response. **Table 4-404** describes the structure of a single jobs field.

Table 4-404 Job status structure

Parameter	Type	Description
jobId	String	Job name.
request	Object	Request content, including the command, URL, and body.

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Parameter	Type	Description
status	String	Job status. The value can be **pending**, **running**, or **complete**.

Example Request

Query the job list and return the job ID and status of each job.

```
GET /ges/v1.0/{project_id}/graphs/movie/jobs/status
```

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
   "jobs": [
      {
         "jobId": "625821631239919436683d0f9aa3-f701-48be-a662-360e6a0455da",
         "status": "complete",
         "request": {
            "command": "import_graph",
            "url": "/ges/v1.0/10001/graphs/moviejx/action?action_id=import-graph",
            "body": {
               "edgesetPath": "file:///root/ges-install/auDatas/ranking_edge-sp.csv",
               "vertexsetPath": "file:///root/ges-install/auDatas/movies_vertex_new.csv",
               "schemaPath": "file:///root/ges-install/auDatas/schema_aikv.xml.bak"
            }
         }
      },
      {
         "jobId": "625821631239919436683fe74caf-f4d3-48b3-b3ee-66daaedcd2ca",
         "status": "complete",
         "request": {
            "command": "import_graph",
            "url": "/ges/v1.0/10001/graphs/moviejx/action?action_id=import-graph",
            "body": {
               "edgesetPath": "file:///root/ges-install/auDatas/ranking_edge-sp.csv",
               "vertexsetPath": "file:///root/ges-install/auDatas/movies_vertex_new.csv",
               "schemaPath": "file:///root/ges-install/auDatas/schema_aikv.xml.bak"
            }
         }
      },
      {
         "jobId": "6258216312399194368daa80df3-e3bd-440d-9764-74f4622a550f",
         "status": "complete",
         "request": {
            "command": "import_graph",
            "url": "/ges/v1.0/10001/graphs/moviejx/action?action_id=import-graph",
            "body": {
               "edgesetPath": "file:///root/ges-install/auDatas/ranking_edge-sp.csv",
               "vertexsetPath": "file:///root/ges-install/auDatas/movies_vertex_new.csv",
               "schemaPath": "file:///root/ges-install/auDatas/schema_aikv.xml.bak"
            }
         }
      },
      {
         "jobId": "625821631239919436680ed2761f-01f7-4fbf-b867-0a9aae6d9c12",
         "status": "complete",
         "request": {
            "command": "import_graph",
```

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```
            "url": "/ges/v1.0/10001/graphs/moviejx/action?action_id=import-graph",
            "body": {
                "edgesetPath": "file:///root/ges-install/auDatas/ranking_edge-sp.csv",
                "vertexsetPath": "file:///root/ges-install/auDatas/movies_vertex_new.csv",
                "schemaPath": "file:///root/ges-install/auDatas/schema_aikv.xml.bak"
            }
        }
    }
  ],
  "result": "success"
}
```


Status code: 400

Example response for a failed request


```
Http Status Code: 400
 {
    "errorMessage": "graph : movidde not exist",
   "errorCode": "GES.8000",
   "result": "failed"
}
```


Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.9.2 Querying the Job Status

Function

This API is used to query the execution status of a job. After asynchronous APIs such as those for querying vertices and edges or executing algorithms are used, job IDs are returned. You can use the job ID to query the execution status of each job.

URI

GET /ges/v1.0/{project_id}/graphs/{graph_name}/jobs/{job_id}/status?offset=*offset*&limit=*limit*

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Table 4-405 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
job_id	Yes	String	Job ID
offset	No	Integer	Offset of a query. The default value is **0**.
limit	No	Integer	Maximum number of records that can be queried. The default value is **100000**.

Response Parameters

Table 4-406 Response body parameters

Parameter	Type	Description
errorMessage	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error message.
errorCode	String	System prompt. • If execution succeeds, this parameter may be left blank. • If execution fails, this parameter is used to display the error code.
status	String	Returned job status after the query is successful. Possible values: • **pending** • **running** • **success** • **failed** This parameter is left blank when the query fails.
data	Object	Algorithm execution result. This parameter is left blank when the query fails.

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Table 4-407 data parameter description

Parameter	Type	Description
vertices	List	Vertex-associated algorithm result
edges	List	Edge-associated algorithm result
outputs	Object	Other results
data_return_size	Integer	Number of records returned after a query
data_offset	Integer	Result offset of a query
data_total_size	Integer	Total amount of result data generated by asynchronous jobs

Example Request

Query the execution status of a job. The query offset is **0**, and the maximum number of returned results is **2**.

```
GET http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/jobs/{job_id}/status?offset=0&limit=2
```

NOTE

SERVER_URL: Address for accessing a graph. For details about its value, see **Using Service Plane APIs**.

Example Response

Status code: 200

Example response for a successful request

```
Http Status Code: 200
{
    "data": {
        "outputs": {
            "data_return_size": 2,
            "vertices": [
                {
                    "id": "Sarah",
                    "label": "user",
                    "properties": {
                        "Occupation": [
                            "other or not specified"
                        ],
                        "Name": [
                            "Sarah"
                        ],
                        "Zip-code": [
                            "55105"
                        ],
                        "Gender": [
                            "F"
                        ],
                        "Age": [
                            "18-24"
                        ]
                    }
```

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```
            },
            {
                "id": "Sidney",
                "label": "user",
                "properties": {
                    "Occupation": [
                        "writer"
                    ],
                    "Name": [
                        "Sidney"
                    ],
                    "Zip-code": [
                        "85296"
                    ],
                    "Gender": [
                        "M"
                    ],
                    "Age": [
                        "18-24"
                    ]
                }
            }
        ],
        "data_offset": 0,
        "data_total_size": 19
    }
  },
  "status": "success"
}
```


Status code: 400

Example response for a failed request


```
Http Status Code: 400
{
"errorMessage":"graph [demo] is not found",
"errorCode":"GES.8402"
}
```


Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

Error Codes

See **Error Codes**.

4.2.10 Cypher Operation APIs

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4.2.10.1 Executing Cypher Queries

Function

Cypher is a widely used declarative graph database query language. It can be used to query data in GES and returns results. Graph statistics are used in Cypher implementation. Currently, the label-based vertex and edge indexes are used during Cypher query and compilation. To use Cypher normally, create indexes by referring to **Cypher Prerequisites**.

URI

POST /ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-cypher-query

Table 4-408 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the project ID, see **Obtaining a Project ID**.
graph_name	Yes	String	Graph name

Example Request

Execute a Cypher query. The Cypher statement is **match (n) return n limit 1**. The returned results are in the format that each element corresponds to a field in the row.

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-cypher-query
{
    "statements": [{
        "statement": "match (n) return n limit 1",
        "parameters": {},
        "resultDataContents": ["row"],
        "includeStats": false
    }]
}
```

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Request Parameters

Table 4-409 Request body parameter

Parameter	Mandatory	Type	Description
statements	Yes	List	Statement group that contains one or more statements. The **statements parameters** table describes the format of each element.

Table 4-410 statements parameters

Parameter	Mandatory	Type	Description
statement	Yes	String	Cypher statement
parameters	Yes	Object	Cypher statement parameters, which are used for parameterized queries. By default, this field is left blank. For details, see **parameterized queries**.
resultDataContents	No	String or List	Format of the returned result. You can set one or more formats. Available values are **row**, **graph**, and **raw** (added in version 2.2.27).
includeStats	No	Boolean	Whether the returned result contains addition, deletion, and modification statistics. If this parameter is not set, the returned result does not contain the information by default.
runtime	No	String	Executor type. The value can be **map** or **slotted**. The default value is **map**. The slotted executor is supported since version 2.3.15.
executionMode (2.2.23)	No	String	Execution mode. Set this parameter to **sync** for synchronous execution and to **async** for asynchronous execution. If this parameter is not set, the execution is synchronous by default. For details about how to obtain the query result in asynchronous mode, see **Querying Job Status on the Service Plane**.

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Parameter	Mandatory	Type	Description
limit (2.2.23)	No	Int	Maximum number of results of the asynchronous query. This parameter is valid only when **executionMode** is **sync**. The default value is **100000**.
transactional	No	Bool	Whether the Cypher request is transactional. The default value is **false**. For details about Cypher transactions, see **Cypher transactions**.

NOTE

- You can add the **explain** or **profile** prefix before a statement to display the query plan. The **explain** prefix displays only the query plan but does not execute the statement. The **profile** prefix displays the query plan and executes the statement.
- Description of the **runtime** field: Compared with the map executor, the slotted executor completes more statement data flow analysis in the plan generation phase of statements. In most cases, it executes faster while requiring less memory.
- In asynchronous mode (**executionMode** is **async**), cypher query results can be exported to CSV files (GES 2.3.4 or later supports this function). For details, see **Exporting Job Execution Results to Files**. Currently, the following values can be returned:
  1. Vertex and edge single-value properties, vertex and edge IDs, and group counts.
  2. The current version does not support exporting object types. Objects are converted to null values in the CSV file.
- Cypher transactions (database edition only):
  1. For database edition graphs, Cypher transactions are supported. You can set **transactional** to **true** to enable the function to ensure the atomicity of a single Cypher statement. Transactions supporting multiple Cypher statements are not available. Transactions in GES use a serializability isolation level.
  2. The transaction time window is limited to 5s in the underlying storage engine of GES. Cypher transactions cannot last exceeding 5s. For complex queries, such as multi-hop queries, the running time may exceed 5s. The transaction times out and the submission fails.

     In this case, you can use the **dbms.killQuery** program of Cypher to terminate a Cypher transaction (for details, see **Cypher API-Functions and Procedures**) and restore all changes caused by the Cypher request.

Response Parameters

Table 4-411 Response body parameters

Parameter	Type	Description
results	List	Each element of the list is the return result of a Cypher statement.
errors	List	Each element in the list contains the code and message information in string form.

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Table 4-412 Elements of the results parameter

Parameter	Type	Description
columns	List	Name of a returned field
data	List	Returned data value. Each element indicates a record.
stats	Object	Addition, deletion, and modification statistics
plan	Object	If the Cypher statement contains the explain or profile prefix, this field contains the query plan. Otherwise, this field is not displayed. The profile feature is supported since version 2.3.12.
jobId(2.3.10)	String	Asynchronous job ID if the request is executed asynchronously
jobType(2.3.10)	Integer	Type of the asynchronous job if the request is executed asynchronously

Table 4-413 Elements of the data parameter

Parameter	Type	Description
row	List	Content of a specific row. Each element corresponds to a field in the row. This parameter is displayed only when **resultDataContents** is empty or contains **row**.
meta	List	Type of each field in a row. This parameter is displayed only when **resultDataContents** is empty or contains **row**.
graph	Object	Information returned in graph format. This parameter is displayed only when **resultDataContents** contains **graph**.
raw(2.2.27)	List	Information returned in raw format. This parameter is displayed only when **resultDataContents** contains **raw**.

Table 4-414 stats elements in a response

Parameter	Type	Description
contains_updates	Boolean	Whether data is modified during the query

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Parameter	Type	Description
edges_created	Integer	Number of created edges
edges_deleted	Int	Number of deleted edges
labels_set	Integer	Number of labels that have been set
properties_set	Integer	Number of properties that have been set
vertices_created	Integer	Number of created vertices
vertices_deleted	Integer	Number of deleted vertices

Example Response

Status code: 200

Example response for a successful request (synchronous call)

```
Http Status Code: 200
{
   "results": [
      {
         "columns": ["n"],
         "data": [
            {
               "row": [
                  {
                     "occupation": "artist",
                     "gender": "F",
                     "Zip-code": "98133",
                     "userid": 0,
                     "age": "25-34"
                  }
               ],
               "meta": [
                  {
                     "id": "46",
                     "type": "node",
                     "labels": [
                        "user"
                     ]
                  }
               ]
            }
         ],
         "stats": {
            "contains_updates": false,
            "edges_created": 0,
            "edges_deleted": 0,
            "labels_set": 0,
            "properties_set": 0,
            "vertices_created": 0,
            "vertices_deleted": 0
          }

       }
```

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```
  ],
  "errors": []
}
```

Status code: 200

Example response for a successful request (asynchronous call)

```
Http Status Code: 200
{
  "results": [
    {
      "columns": [
        "jobId",
        "jobType"
      ],
      "jobId": "b64a5846-e306-4f87-b0f1-d595ee2a9910",
      "jobType": 1,
      "data": [
        {
          "row": [
            "b64a5846-e306-4f87-b0f1-d595ee2a9910",
            1
          ],
          "meta": [
            null,
            null
          ]
        }
      ]
    }
  ],
  "errors": []
}
```

Status code: 400

Example response for a failed request

```
Http Status Code: 400
{
  "results": [],
  "errors": [
    {
      "code": "GES.8904",
      "message": "Label index in vertices is not found."
    }
  ]
}
```

Status Codes

Return Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permissions.
404 Not Found	No resources found.
500 Internal Server Error	Internal server error.
503 Service Unavailable	Service unavailable.

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Error Codes

See **Error Codes**.

4.2.10.2 Basic Operations and Compatibility

Basic Operations

Operation	Cypher Statement
Querying vertices	match (n) return n
Querying edges	match (n)-[r]->(m) return n, r, m
Querying paths	match (n:user)-[r]->(m:movie)-->(s:series) return n,r,m,s
Querying information by specifying filtering criteria	match(n:user) where n.userid>=5 return n
Grouping and aggregating	match(n:movie) return n.genres, count(*)
Deduplicating	match(n:movie) return distinct n.genres
Sorting	match(n:movie) return n order by n.movieid
Creating a vertex	create (n:user{userid:1}) return n
Creating an edge	match (n:user{userid:15}),(m:movie{movieid:10}) create (n)-[r:rate]->(m)
Deleting a vertex	match (n:user{userid:1}) delete n
Modifying labels	match (n:user{userid:1}) set n:movie return n
Modifying properties	match (n:user{userid:1}) set n.userid=2 return n

Compatibility to Cypher

1. Cypher clauses

   Cypher implements a couple of clauses. You can combine clauses to implement different query semantics, including vertex and edge filtering, multi-hop query, sorting and deduplication, and grouping and aggregation.

   Currently, GES supports the Cypher clauses listed in the following table.

   Table 4-415 Supported Cypher clauses

Clause	Support	Example
match	Partially supported	match (n:movie) return n

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Clause	Support	Example
optional match	Partially supported	optional match (n)-->(m) where id(n)='1' return m
return	Supported	return [1,2,3] as p
with	Supported	match (n) with labels(n) as label, count(*) as count where count > 10 return *
where	Supported	match (n:movie) where n.movieid > 10 return n
order by	Supported	match (n:movie) return n order by n.genres
skip	Supported	match (n:movie) return n order by n.genres skip 5
limit	Supported	match (n:movie) return n order by n.genres skip 5 limit 10
create	Supported	create (n:user{_ID_: 'Jack' }) return n
delete	Supported	match (n:movie)<-[r]-(m:user) delete r
set	Supported	match (n:user{userid:0}) set n.gender='M' return n
call procedures	Supported	call db.schema()
unwind	Supported	unwind [1, 2, 3] as p return p
union	Supported	match (n:movie) return id(n) union match (n:user) return id(n) **NOTE** Union is available for graphs smaller than 10 billion edges only.

NOTE

1. Currently, merge and foreach operations are not supported. Cypher statements cannot add or delete indexes.
2. GES metadata is not schema-free, and the vertex and edge label properties are strictly restricted. Therefore, the remove operation is not supported.
3. The order by clause does not support sorting of the list type. When Cardinality of the property value is not single, the sorting result is unknown.

– Available items for the match clause

Item	Description	Example Clauses	Earliest Version Required

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Vertex pattern	Patterns for matching vertex with specified labels, properties, and IDs.	match (n:movie{title:'hello'}) match (n) where id(n)='xx'	2.2.16
Edge pattern	Patterns for matching directional and non-directional edges with specified labels and properties. Specified IDs of both start and end vertices are supported.	match (n)-[r] -> (m) match (n)-[r]- (m) match (n)-[r:rate{Rating:1}] - (m) match (n)-[r]- (m) where id(n)='x'and id(m)='y'	2.2.16
Path	Anonymous paths	match (n)-[r]->(m)-->(s)	2.2.16
	Named paths	match p=(n)-[r]->(m)-->(s)	2.2.19
Multiple patterns	You can enter multiple patterns after **match** and separate them with commas (,). match (n)-[r]->(m), (m)-->(s)		2.2.16
Multi-match	You can enter multiple match clauses. You can use **with** to connect multiple clauses. match (n)-[r]->(m) with m match (m)-->(s)		2.2.16
Variable-length path pattern	Patterns for matching variable-length paths starting with a specified vertex. match p=(n)-[r*1..3]->(m) where id(n)='xx'return p match p=(n{title:'name'})-[r*1..3]->(m) return p		2.2.19
	Traversal conditions for matching variable-length paths. match p=(n)-[r*1..3]->(m) where id(n)='xx'and all (x in nodes(p) where x.prop='value1') return p		2.2.28
	Both start vertex and end vertex of a variable-length path can be specified. match p=(n)-[r*1..3]->(m) where id(n)='xx' and id(m)='y' return p		2.3.9
	Deduplication by end vertex is not supported: match p=(n)-[r*1..3]->(m) where id(n)='xx' and id(m)='yy'return distinct m		No

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2. Parameterized queries

   Cypher supports parameterized queries. Numeric and string values in a query statement are extracted and converted to parameters for faster compilation, improving the query speed.

   There are some examples of parameterized queries:

   – Example 1

   ```
   POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?
   action_id=execute-cypher-query
   {
       "statements": [{
           "statement": " match (n:user) where n.occupation = $occupation return n",
           "parameters": {
               "occupation" : "artist"
            },
           "resultDataContents": ["row"]
       }]
   }
   ```

   – Example 2

   ```
   POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?
   action_id=execute-cypher-query
   {
       "statements": [{
           "statement": " match (n:user {`Zip-code`:'98133'}) set n = $props return n",
           "parameters": {
                "props": {
                "gender": "M",
                "age": "56+"
              }
            },
           "resultDataContents": ["row"]
       }]
   }
   ```

   NOTE

   There are some scenarios where parameterized queries are not supported. The following syntax is not valid:

   1. Using **$param** to search by property key and value. For example, **match (n) where n.$param = 'something'**
   2. Using **$code** for vertex and edge labels. For example, **match (n:user) set n:$code**

3. Supported data types

   Currently, GES supports 10 data types: char, char_array, float, double, Boolean, long, Integer, date, enum, and string. Both Boolean and numeric types are supported in the Cypher syntax. The following table lists the mapping between other types and Cypher data types.

Table 4-416 Mapping between data types of GES and Cypher

GES	Cypher	Description
char	String	-
char_array	String	-
string	String	-

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GES	Cypher	Description
date	Temporal	Currently, Cypher dates can be converted into GES dates, but Cypher date functions cannot be used for inputting a date.

Table 4-417 Special types supported by Cypher

Type	Supported	Example
Node	Yes	match (n) return n limit 10
Relationship	Yes	match (n)-[r]->(m) return r limit 10
List	Yes	return [1,2,3] as li
Map	Yes	match (n)-->(m) return {start:id(n), end:id(m)}
Path	Yes	match p=(n1)-[:friends*1..2]-(n2) return p limit 10
Point, Spatial	No	-

NOTE

For the special types listed above, only the List type can be used to match multi-value properties in GES. Other types cannot be used in a set statement for setting the value of a property.

4. Vertex ID compatibility
   - Cypher does not provide the syntax for setting the ID when a vertex is added. In GES, however, an ID of the string type is required to uniquely identify a vertex. To use the Cypher syntax in GES, add **_ID_** to specify the ID of a vertex in the create statement. For example, the **create(n{_ID_:'123456'})** statement creates a vertex whose ID is 123456.
   - If the ID is not specified, a random ID is generated for the vertex.

     NOTE

     The **_ID_** identifier is supported only in the create statement. The match and set clauses do not support the **_ID_** identifier. In the match clause, you can use the **id()** function to obtain the vertex ID.

4.2.10.3 Supported Expressions, Functions, and Procedures

Expression

Cypher queries support multiple expressions and can be used in combination to form various filter criteria. Currently, the following expressions are supported:

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Operation Type	Expression	Example
Logical operations	and	match (n:user) where n.age='Under 18' and n.gender='F' return n
	or	match(n:user) where n.`Zip-code`='22181' or n.userid=6 return n
	not	match(n:movie) where not n.genres contains 'Drama' return n
Null value judgment	is null	match (n) where n.userid is null return n
	is not null	match (n) where n.userid is not null return n
Comparison calculation	>,>=,<,<=,=,<>	match(n:user) where n.userid>=5 return n
Arithmetic operators (2.3.10)	+,-,*,/,%,^	return (1+3)%3
String comparisons	starts with	match(n:movie) where n.genres starts with 'Comedy' return n
	ends with	match(n:movie) where n.genres ends with 'Drama' return n
	contains	match(n:movie) where n.genres contains 'Drama' return n
List-related operation	in	match(n:student) where 'math' in n.courses return n
	[]	match(n:user) return n[' userid'] with [1, 2, 3, 4] as list return list[0] with [1, 2, 3, 4] as list return list[0..1] match p=(n)-->(m) return [x in nodes(p) where x.gender='F'|id(x)]
Date expressions (2.3.10)	.year, .month, .day, .hour, .minute, .second, .dayOfWeek	Year, month, and day of a specific date: with '2000-12-27 23:44:41' as strVal with datetime(strVal) as d2 return d2.year, d2.month, d2.day, d2.hour, d2.minute, d2.second,d2.dayOfWeek, d2.ordinalDay

NOTE

The where clause in Cypher queries does not support regular expressions.

Function

Cypher supports the following functions for grouping, aggregation, and vertex and edge operations:

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1. Aggregate

Function	Earliest Version Supported	Description	Example
count	2.2.17	Returns the total number of results.	match (n) return count(*) match (n) return count(n.userid)
collect	2.2.17	Collects results into a list.	match (n:movie) return n.genres, collect(n) as movieList
sum	2.3.3	Returns the sum of values.	unwind [1, 2.0, 3] as p return sum(p)
avg	2.3.3	Returns the average of values.	unwind [1, 2.0, 3] as p return avg(p)
min	2.3.3	Returns the minimum value.	unwind [1, 2.0, 3] as p return min(p)
max	2.3.3	Returns the maximum value.	unwind [1, 2.0, 3] as p return max(p)

2. Regular functions

   Based on the types of input parameters, regular functions are classified into vertex and edge functions, path functions, list functions, and value functions.

   Table 4-418 Vertex and edge functions

Function	Earliest Version Supported	Description	Example
id	2.2.16	Obtains the ID of a vertex.	match (n) return id(n)
labels	2.2.16	Obtains labels of a vertex.	match (n) return labels(n)
type	2.2.16	Obtains the label of an edge.	match(n)-[r]->(m) return type(r)
degree	2.2.26	Obtains the degree of a vertex.	match (n) where id='Vivian' return degree(n)

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Function	Earliest Version Supported	Description	Example
inDegree	2.2.26	Obtains the indegree of a vertex.	match (n) where id='Vivian' return inDegree(n)
outDegree	2.2.26	Obtains the outdegree of a vertex.	match (n) where id='Vivian' return outDegree(n)
startNode	2.3.10	Obtains the start vertex of an edge.	match (n)-[r]->(m) return startNode(r)
endNode	2.3.10	Obtains the end vertex of an edge.	match (n)-[r]->(m) return endNode(r)

Table 4-419 Path functions (2.2.19)

Function	Earliest Version Supported	Description	Example
length	2.2.19	Obtains the path length.	match p=(n)-[:friends*1..2]->(m) return length(p)

Table 4-420 List functions

Function	Earliest Version Supported	Description	Example
head	2.3.10	Obtains the first element of a list.	with [1,2,3,4] as list return head(list)
last	2.3.10	Obtains the last element of a list.	with [1,2,3,4] as list return last(list)
size	2.3.10	Obtains the list length.	with [1,2,3,4] as list return size(list)
range(2.3.10)	2.3.10	Generates a list.	return range(1,5), range(1,5,2)

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Table 4-421 Value functions

Function	Earliest Version Supported	Description	Example
toString	2.2.21	Converts a value to a string.	match (n) where toString(labels(n)) contains 'movi' return n
toUpper	2.2.26	Converts a string into uppercase letters.	match (n:movie) return toUpper(n.title)
toLower	2.2.26	Converts a string into lowercase letters.	match (n:movie) return toLower(n.title)
toInteger	2.2.29	Converts a string to an int number.	with '123' as p return toInteger(p)
toLong	2.2.29	Converts a string to a long number.	with '123' as p return toLong(p)
toFloat	2.2.29	Converts a string to a float number.	with '123.4' as p return toFloat(p)
toDouble	2.2.29	Converts a string to a double number.	with '123.4' as p return toDouble(p)
toBoolean	2.2.29	Converts a string to a bool value.	with 'true' as p return toBoolean(p)
size	2.2.29	Obtains the string length.	with 'GES' as p return size(p)
subString	2.3.10	Truncates a part of a string.	return subString('abc', 1), subString('abcde', 1,2)
coalesce	2.3.10	Obtains the first non-null value of the parameters.	return coalesce(null, '123')

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Table 4-422 Mathematical functions

Function	Earliest Version Supported	Description	Example
floor	2.3.10	Rounds a number down to the nearest integer.	return floor(4.1)
ceil	2.3.10	Rounds a number up to the nearest integer.	return ceil(4.1)
round	2.3.14	Round	return round(3.4), round(3.5)
abs	2.3.14	Absolute value function	return abs(-3),abs(-3.5)
sin	2.3.14	Sine function	return sin(pi()/2)
cos	2.3.14	Cosine function	return cos(0),cos(pi()/2)
tan	2.3.14	Tangent function	return tan(pi()/4)
acos	2.3.14	Inverse cosine function	return acos(1)
asin	2.3.14	Inverse sine function	return asin(0)
atan	2.3.14	Inverse tangent function	return atan(1)
cot	2.3.14	Cotangent function	return cot(pi()/4)
radians	2.3.14	Converts degree to radian.	return radians(180)
degrees	2.3.14	Converts radian to degree.	return degrees(pi())
pi	2.3.14	Returns the approximate value of Pi (π).	return pi()

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Table 4-423 Date and time functions

Function	Earliest Version Supported	Description	Example
datetime(val)	2.3.10	Returns the time based on the timestamp.	return datetime(1688696395)
datetime()	2.3.14	Obtains the current time (valid only for read statements).	return datetime()
timestamp(val)	2.3.10	Returns the timestamp based on the time string.	return timestamp('2023-07-07 02:20:42')
timestamp()	2.3.14	Obtains the current timestamp (valid only for read statements).	return timestamp()
localDatetime	2.3.14	Converts a time or timestamp to a local time string.	return localDatetime(timestamp())

Table 4-424 Predicate functions

Function	Earliest Version Supported	Description	Example
all	2.2.19	If all elements meet the expression, **true** is returned.	all (x in p where x>1)
any	2.2.19	If any element meets the expression, **true** is returned.	any (x in p where x>1)

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Function	Earliest Version Supported	Description	Example
none	2.2.19	If all elements cannot meet the expression, **true** is returned.	none (x in p where x>1)
single	2.2.19	If only one element meets the expression, **true** is returned.	single (x in p where x>1)

Table 4-425 Algorithm expressions

Function	Earliest Version Supported	Description	Example
shortestPath	2.3.2	Returns the shortest path between two vertices.	The following statement returns the shortest path between the given vertices **n** and **m**. The direction is m to n, and the edge label is **rate**: with n,m, shortestPath((n)<-[:rate*]-(m)) as p return p
allShortestPaths	2.3.2	Returns all shortest paths between two vertices.	The following statement returns all shortest paths between the given vertices **n** and **m**: with n,m, allShortestPaths((n)-[*]-(m)) as p return p

NOTE

Procedure

Currently, GES supports the following procedures.

Procedure	Statement
Obtaining graph pattern information	call db.schema()
Obtaining vertex labels	call db.labels()

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Procedure	Statement
Querying the Cypher statements that are being executed	call dbms.listQueries()
Terminating a Cypher statement based on **queryId**	call dbms.killQuery('queryId')
Querying indexes	call db.indexes()
Full-text indexing for querying vertices that meet the search conditions	call db.index.fulltext.queryNodes()
Full-text indexing for querying edges that meet the conditions	call db.index.fulltext.queryRelationships()
Merging nodes	call apoc.refactor.mergeNodes(nodeList, refactorConfig)

NOTE

Full-text indexes support six types of queries: prefix, wildcard, regexp, fuzzy, match, and combine. To use full-text indexes, you need to call the API for creating a full-text index.

NOTE

Function and procedure names are case sensitive and must be in lower camel case.

- Example of a full-text index query request

```
POST http://{SERVER_URL}/ges/v1.0/{project_id}/graphs/{graph_name}/action?action_id=execute-cypher-query
{
   "statements": [
      {
         "statement": "call db.index.fulltext.queryNodes('combine', {title:'1977'}) yield node, score return node, score skip 1 limit 10",
         "resultDataContents": [
            "row"
         ],
         "parameters": {}
      }
   ]
}
```

- Parallel edge processing policy

  When using Cypher to add edges, you can add duplicate edges. Duplicate edges are two edges with the same source vertex and target vertex.

- How to add an edge without a label

  When you use a Cypher statement to add an edge, set the label of the edge to the default value **__DEFAULT__**. For example, **create ()-[r:__DEFAULT__]->() return r**.

Querying the Schema Structure Using Cypher

- Function

  You can call the **db.schema ()** function using Cypher to query the structure of a generated schema (obtained from OBS).

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- Query statement
  - Name: Schema structure query
  - Statement: **call db.schema()**
  - Note:

    If you did not call the API for generating the schema structure, the returned schema file contains all labels.

    If you have called the API for generating the schema structure, this API returns the labels as the vertices and the relationships between the labels as edges.

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5 GES Metrics

Function

This chapter describes metrics reported by GES as well as their namespaces, lists, and dimensions. You can use APIs to query the metric information generated for GES.

Namespace

SYS.GES

Metrics

Table 5-1 GES metrics

Metric ID	Name	Description	Value Range	Monitored Object
ges001_vertex_util	Vertex Capacity Usage	Capacity usage of vertices in a graph instance. The value is the ratio of the number of used vertices to the total vertex capacity. Unit: %	0 to 100 Value type: Float	GES instance
ges002_edge_util	Edge Capacity Usage	Capacity usage of edges in a graph instance. The value is the ratio of the number of used edges to the total edge capacity. Unit: %	0 to 100 Value type: Float	GES instance
ges003_average_import_rate	Average Import Rate	Average rate of importing vertices or edges to a graph instance Unit: count/s	0 to 400000 Value type: Float	GES instance

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Metric ID	Name	Description	Value Range	Monitored Object
ges004_request_count	Request Quantity	Number of requests received by a graph instance Unit: count	≥ 0 Value type: Integer	GES instance
ges005_average_response_time	Average Response Time	Average response time of requests received by a graph instance Unit: ms	≥ 0 Value type: Integer	GES instance
ges006_min_response_time	Minimum Response Time	Minimum response time of requests received by a graph instance Unit: ms	≥ 0 Value type: Integer	GES instance
ges007_max_response_time	Maximum Response Time	Maximum response time of requests received by a graph instance Unit: ms	≥ 0 Value type: Integer	GES instance
ges008_read_task_pending_queue_size	Length of the Waiting Queue for Read Tasks	Length of the waiting queue for read requests received by a graph instance. This metric is used to view the number of read requests waiting in the queue. Unit: count	≥ 0 Value type: Integer	GES instance
ges009_read_task_pending_max_time	Maximum Waiting Duration of Read Tasks	Maximum waiting duration of read requests received by a graph instance Unit: ms	≥ 0 Value type: Integer	GES instance
ges010_pending_max_time_read_task_type	Type of the Read Task That Waits the Longest	Type of the read request that waits the longest in a graph instance. You can find the corresponding task name in GES documents.	≥ 1 Value type: Integer	GES instance
ges011_read_task_running_queue_size	Length of the Running Queue for Read Tasks	Length of the running queue for read requests received by a graph instance. This metric is used to view the number of running read requests. Unit: count	≥ 0 Value type: Integer	GES instance

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Metric ID	Name	Description	Value Range	Monitored Object
ges012_read_task_running_max_time	Maximum Running Duration of Read Tasks	Maximum running duration of read requests received by a graph instance Unit: ms	≥ 0 Value type: Integer	GES instance
ges013_running_max_time_read_task_type	Type of the Read Task That Runs the Longest	Type of the read request that runs the longest in a graph instance. You can find the corresponding task name in GES documents.	≥ 1 Value type: Integer	GES instance
ges014_write_task_pending_queue_size	Length of the Waiting Queue for Write Tasks	Length of the waiting queue for write requests received by a graph instance. This metric is used to view the number of write requests waiting in the queue. Unit: count	≥ 0 Value type: Integer	GES instance
ges015_write_task_pending_max_time	Maximum Waiting Duration of Write Tasks	Maximum waiting duration of write requests received by a graph instance Unit: ms	≥ 0 Value type: Integer	GES instance
ges016_pending_max_time_write_task_type	Type of the Write Task That Waits the Longest	Type of the write request that waits the longest in a graph instance. You can find the corresponding task name in GES documents.	≥ 1 Value type: Integer	GES instance
ges017_write_task_running_queue_size	Length of the Running Queue for Write Tasks	Length of the running queue for write requests received by a graph instance. This metric is used to view the number of running write requests. Unit: count	≥ 0 Value type: Integer	GES instance

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Metric ID	Name	Description	Value Range	Monitored Object
ges018_write_task_running_max_time	Maximum Running Duration of Write Tasks	Maximum running duration of write requests received by a graph instance Unit: ms	≥ 0 Value type: Integer	GES instance
ges019_running_max_time_write_task_type	Type of the Write Task That Runs the Longest	Type of the write request that runs the longest in a graph instance. You can find the corresponding task name in GES documents.	≥ 1 Value type: Integer	GES instance
ges020_computer_resource_usage	Computing Resource Usage	Computing resource usage of each graph instance Unit: %	0 to 100 Value type: Float	GES instance
ges021_memory_usage	Memory Usage	Memory usage of each graph instance Unit: %	0 to 100 Value type: Float	GES instance
ges022_iops	IOPS	Number of I/O requests processed by each graph instance per second Unit: count/s	≥ 0 Value type: Integer	GES instance
ges023_bytes_in	Network Input Throughput	Data input to each graph instance per second over the network Unit: byte/s	≥ 0 Value type: Float	GES instance
ges024_bytes_out	Network Output Throughput	Data sent to the network per second from each graph instance Unit: byte/s	≥ 0 Value type: Float	GES instance
ges025_disk_usage	Disk Usage	Disk usage of each graph instance Unit: %	0 to 100 Value type: Float	GES instance
ges026_disk_total_size	Total Disk Size	Total data disk space of each graph instance Unit: GB	≥ 0 Value type: Float	GES instance

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Metric ID	Name	Description	Value Range	Monitored Object
ges027_disk_used_size	Disk Space Used	Used data disk space of each graph instance Unit: GB	≥ 0 Value type: Float	GES instance
ges028_disk_read_throughput	Disk Read Throughput	Data volume read from the disk in a graph instance per second Unit: byte/s	≥ 0 Value type: Float	GES instance
ges029_disk_write_throughput	Disk Write Throughput	Data volume written to the disk in a graph instance per second Unit: byte/s	≥ 0 Value type: Float	GES instance
ges030_avg_disk_sec_per_read	Average Time per Disk Read	Average time used each time when the disk of a graph instance reads data Unit: second	≥ 0 Value type: Float	GES instance
ges031_avg_disk_sec_per_write	Average Time per Disk Write	Average time used each time when data is written to the disk of a graph instance Unit: second	≥ 0 Value type: Float	GES instance
ges032_avg_disk_queue_length	Average Disk Queue Length	Average I/O queue length of the disk in a graph instance Unit: count	≥ 0 Value type: Integer	GES instance

Dimensions

Table 5-2 Dimensions

Key	Value
instance_id	GES instance

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Mapping Between Task Types and Names

Table 5-3 Task types and corresponding task names

Type	Name
100	Querying a vertex
101	Creating a vertex
102	Deleting a vertex
103	Modifying a vertex property
104	Adding a vertex label
105	Deleting a vertex label
200	Querying an edge
201	Creating an edge
202	Deleting an edge
203	Modifying an edge property
300	Querying schema details
301	Adding a Label
302	Modifying a Label
303	Querying a Label
304	Modifying a property
400	Querying graph details
401	Clearing a graph
402	Incrementally importing graph data online
403	Creating a graph
405	Deleting a graph
406	Exporting a graph
407	filtered_khop
408	Querying path details
409	Incrementally importing graph data offline
500	Creating a graph backup
501	Restoring a graph from a backup
601	Creating an index.

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Type	Name
602	Querying an index
603	Updating an index
604	Deleting an index
700	Running the algorithm
800	Querying an asynchronous task

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6 Appendix

6.1 Status Codes

Table 6-1 describes status codes.

Table 6-1 Status codes

Status Code	Message	Description
100	Continue	The client should continue with its request. This interim response is used to inform the client that part of the request has been received and has not yet been rejected by the server.
101	Switching Protocols	The protocol should be switched. The protocol can only be switched to a newer protocol. For example, the current HTTP protocol is switched to a later version of HTTP.
201	Created	The request has been fulfilled and a new resource has been created.
202	Accepted	The request has been accepted, but the processing has not been completed.
203	Non-Authoritative Information	The server has successfully processed the request, but is returning information that may be from another source.
204	NoContent	The request has been fulfilled, but the HTTP response does not contain a response body. The status code is returned in response to an HTTP OPTIONS request.

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Status Code	Message	Description
205	Reset Content	The server has successfully processed the request, but does not return any content.
206	Partial Content	The server has successfully processed the partial GET request.
300	Multiple Choices	There are multiple options for the location of the requested resource. The response contains a list of resource characteristics and addresses from which a user terminal (such as a browser) can choose the most appropriate one.
301	Moved Permanently	The requested resource has been assigned a new permanent URI, and the new URI is contained in the response.
302	Found	The requested resource resides temporarily under a different URI.
303	See Other	The response to the request can be found under a different URI. The response to the request can be found under a different URI, and should be retrieved using a GET or POST method.
304	Not Modified	The requested resource has not been modified. In such a case, there is no need to retransmit the resource since the client still has a previously-downloaded copy.
305	Use Proxy	The requested resource is available only through a proxy.
306	Unused	The HTTP status code is no longer used.
400	BadRequest	Invalid request. The client should modify the request instead of re-initiating it.
401	Unauthorized	This status code is returned after the client provides the authentication information, indicating that the authentication information is incorrect or invalid.
402	Payment Required	This status code is reserved for future use.

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Status Code	Message	Description
403	Forbidden	The server has received the request and understood it, but the server is refusing to respond to it. The server has received and understood the request; yet it refused to respond, because the request is set to deny access. Do not retry the request before modification.
404	NotFound	The requested resource could not be found. The client should modify the request instead of re-initiating it.
405	MethodNotAllowed	The method specified in the request is not supported by the requested resource. The client should modify the request instead of re-initiating it.
406	Not Acceptable	The server could not fulfill the request according to the content characteristics of the request.
407	Proxy Authentication Required	This code is similar to 401, but indicates that the client must first authenticate itself with the proxy.
408	Request Time-out	The server timed out waiting for the request. The client may repeat the request without modifications at any time later.
409	Conflict	The request could not be processed due to a conflict in the request. This status code indicates that the resource that the client is attempting to create already exists, or that the request has failed to be processed because of the update of the conflict request.
410	Gone	The requested resource cannot be found. The status code indicates that the requested resource has been deleted permanently.
411	Length Required	The server is refusing to process the request without a defined **Content-Length**.
412	Precondition Failed	The server does not meet one of the preconditions that the requester puts on the request.

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Status Code	Message	Description
413	Request Entity Too Large	The server is refusing to process a request because the request entity is too large for the server to process. The server may disable the connection to prevent the client from sending requests consecutively. If the server is only temporarily unable to process the request, the response will contain a **Retry-After** header field.
414	Request-URI Too Large	The Request-URI is too long for the server to process.
415	Unsupported Media Type	The server does not support the media type in the request.
416	Requested range not satisfiable	The requested range is invalid.
417	Expectation Failed	The server has failed to meet the requirements of the **Expect** request-header field.
422	UnprocessableEntity	The request was well-formed but was unable to be followed due to semantic errors.
429	TooManyRequests	The client has sent excessive number of requests to the server within a given time (exceeding the limit on the access frequency of the client), or the server has received an excessive number of requests within a given time (beyond its processing capability). In this case, the client should resend the request after the time specified in the **Retry-After** header of the response has elapsed.
500	InternalServerError	The server is able to receive the request but unable to understand it.
501	Not Implemented	The server does not support the requested function.
502	Bad Gateway	The server was acting as a gateway or proxy and received an invalid request from the remote server.
503	ServiceUnavailable	The requested service is invalid. The client should modify the request instead of re-initiating it.
504	ServerTimeout	The request cannot be fulfilled within a given time. This status code is returned to the client only when the **Timeout** parameter is specified in the request.
505	HTTP Version not supported	The server does not support the HTTP protocol version used in the request.

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6.2 Error Codes

6.2.1 Error Codes for Management Plane APIs

If an error occurs in API calling, no result is returned. Identify the cause of error based on the error codes of each API. If an error occurs in API calling, HTTP status code 4xx or 5xx is returned. The response body contains the specific error code and information. If you fail to locate the cause of the error, contact technical support and provide the error code for troubleshooting.

Table 6-2 Error codes

Status Code	Error Code	Error Message	Description	Solution
400	GES.0001	Incorrect parameter.	Incorrect parameter.	1. Check whether the project ID or graph ID in the URL is correct. 2. Check whether the request header is correct, for example, whether **X-Auth-Token** is correct.
400	GES.0016	Resource not found	Resource not found.	1. Check whether the project ID in the URL is the same as the project ID of the token. 2. Check whether the project ID in the URL is the same as the project ID of the graph.
400	GES.7000	The graph does not exist or has been deleted.	The graph does not exist or has been deleted.	1. Call the graph query API to query all graphs. 2. Check whether the project ID or graph ID in the URL is correct.
400	GES.7001	The graph is not running.	The graph is not running.	1. Call the graph query API to query all graphs. 2. View the graph list returned in the preceding step and check whether the graph status corresponding to the graph ID in the URL is **200**.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.7002	The graph is being backed up.	The graph is being backed up.	1. Call the graph query API to query all graphs. 2. View the graph list returned in the preceding step and check whether the graph status corresponding to the graph ID in the URL is **903**.
400	GES.7003	The graph is being stopped or is stopped.	The graph is being stopped or is stopped.	1. Call the graph query API to query all graphs. 2. View the graph list returned in the preceding step and check whether the graph status corresponding to the graph ID in the URL is **900** or **901**.
400	GES.7004	Components at the IaaS layer are faulty.	Components at the IaaS layer are faulty.	Check whether the components at the IaaS layer, such as VPC, ECS, and OBS, are faulty.
408	GES.7005	The underlying service of the graph engine is unavailable.	The underlying service of the graph engine is unavailable.	Try again later or contact technical support.
400	GES.7006	An internal error occurs in the underlying service of the graph engine.	An internal error occurs in the underlying service of the graph engine.	Try again later or contact technical support.
400	GES.7007	The job does not exist.	The job does not exist.	Check whether the job ID in the URL is correct.
400	GES.7008	The job is stopped.	The job is stopped.	Jobs cannot be stopped repeatedly.
400	GES.7009	The job operation is not supported.	The job operation is not supported.	The job operation is not supported.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.7010	Failed to verify the schema and data files.	Failed to verify the schema and data files.	Check whether the schema file matches the edge and vertex data files.
400	GES.7011	The path or name of the schema or data file is invalid.	The path or name of the schema or data file is invalid.	Check whether the name of the scheme, vertex, or edge data file is valid. The name can contain only letters, digits, underscores (_), exclamation marks (!), hyphens (-), dot marks (.), asterisks (*), left brackets, right brackets, and slashes (/).
400	GES.7012	Failed to verify the graph name.	Failed to verify the graph name.	Check the graph name. The name contains 4 to 64 characters, starting with a letter. Only letters, digits, and underscores (_) are supported.
400	GES.7013	The graph name already exists.	The graph name already exists.	1. Call the graph query API to query all graphs. 2. Query the graph list returned in the preceding step and check whether the **name** field in the request body already exists.
400	GES.7014	An error is reported when the metadata verification API is called.	An error is reported when the metadata verification API is called.	Check whether the value of **action_id** is **check-schema**.
400	GES.7015	The graph is not running or is stopped.	The graph is not running or is stopped.	1. Call the graph query API to query all graphs. 2. View the graph list returned in the preceding step and check whether the graph corresponding to the graph ID in the URL exists or is in the **900** status.
400	GES.7016	The request body or header is invalid.	The request body or header is invalid.	Check the API reference and ensure that every configuration item in the request body and header is correctly configured.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.7017	The object does not exist. Check whether the bucket or object name is correct.	The object does not exist. Check whether the bucket or object name is correct.	Check whether the schema, vertex, and edge data files in the request body exist on OBS.
400	GES.7018	The number of graphs or edges reaches the upper limit.	The number of graphs or edges reaches the upper limit.	Call the quota query API to check whether graphs have available quotas.
400	GES.7019	The number of graph backups reaches the upper limit.	The number of graph backups reaches the upper limit.	Call the quota query API to check whether graph backups have available quotas.
400	GES.7020	The VPC does not exist.	The VPC does not exist.	Check whether the VPC ID in the request body exists.
400	GES.7021	The subnet cannot be found in the specified VPC.	The subnet cannot be found in the specified VPC.	Check whether the subnet ID in the request body exists or belongs to the preceding VPC.
400	GES.7022	The security group does not exist.	The security group does not exist.	Check whether the security group ID in the request body exists.
400	GES.7023	The graph size index is invalid.	The graph size index is invalid.	Check whether the graph size index in the request body is valid.
400	GES.7024	The graph backup does not exist or has been deleted.	The graph backup does not exist or has been deleted.	1. Call the backup query API to query all backups of a specified graph. 2. Check whether the backup ID or graph ID in the URL is correct.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.7027	Failed to create an agency.	Failed to create an agency.	1. Assign the security administrator role to the user group to which the user belongs. 2. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.7028	Failed to authorize an agency.	Failed to authorize an agency.	1. Assign the security administrator role to the user group to which the user belongs. 2. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.7029	The agency resource exceeds the quota limit.	The agency resource exceeds the quota limit.	Check whether the agency quota has reached the limit on the IAM page.
400	GES.7030	Agency query error.	Agency query error.	Check the error message for detailed information.
400	GES.7031	Invalid binding type of an EIP.	Invalid binding type of an EIP.	Confirm the EIP binding type. The value can be either of the following: • **bind_existing**
400	GES.7032	The EIP resource exceeds the quota limit.	The EIP resource exceeds the quota limit.	Check whether the EIP resource reaches the quota limit on the VPC page.
400	GES.7033	Invalid EIP ID.	Invalid EIP ID.	If the EIP binding type is set to **bind_existing**, ensure that the EIP ID exists.
400	GES.7034	Resources in the current AZ have been sold out.	Resources in the current AZ have been sold out.	Switch to another AZ and try again.
400	GES.7035	Invalid region code.	Invalid region code.	Enter the correct region code.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.7036	The target version is earlier than the current version.	The target version is earlier than the current version.	A graph can only be upgraded to a later version.
400	GES.7037	The graph is not in the **Stopped** state.	The graph is not in the **Stopped** state.	Check whether the graph is in the **Stopped** state.
400	GES.7038	You cannot bind an EIP to a graph that has bound an EIP.	You cannot bind an EIP to a graph that has bound an EIP.	You cannot bind an EIP to a graph that has bound an EIP.
400	GES.7039	You cannot unbind an EIP from a graph that has not bound an EIP.	You cannot unbind an EIP from a graph that has not bound an EIP.	You cannot unbind an EIP from a graph that has not bound an EIP.
400	GES.7040	Failed to back up a graph.	Failed to back up a graph.	Failed to restore a graph from the backup you select.
400	GES.7041	Insufficient permission.	Insufficient permissions.	Insufficient permissions.
400	GES.7042	The graph is being created.	The graph is being created.	The graph is being created.
400	GES.7048	Invalid graph operation.	Invalid graph operation.	Check whether the value of **action_id** is **start**, **stop**, **import-graph**, **export-graph**, **clear-graph**, or **upgrade**.
400	GES.7049	The parameter does not exist.	The parameter does not exist.	Check whether the request body is consistent with that in the API reference. Mandatory parameters must be set.
400	GES.7050	The parameter is empty.	The parameter is empty.	Check whether the request body is consistent with that in the API reference. Mandatory parameters must be set.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.7051	Components at the IaaS layer are faulty.	Components at the IaaS layer are faulty.	1. If the network fluctuates, try again later. 2. If the fault persists, obtain logs and analyze them for fault locating.
400	GES.7052	Invalid CPU architecture of the graph instance.	Invalid CPU architecture of the graph instance.	Check whether the value of **arch** is set to **x86_64** or **aarch64** when the graph is created.
400	GES.7054	The graph is being deleted or has been deleted.	The graph is being deleted or has been deleted.	This error occurs in concurrent deletion scenarios. Generally, a message indicating that the graph does not exist is displayed when you try again later.
400	GES.7056	The graph of the current flavor cannot be scaled out.	The graph of the current flavor cannot be scaled out.	Currently, ten-thousand-edge and ten-billion-edge graphs cannot be scaled out. Check whether the graph is a ten-thousand-edge or ten-billion-edge one.
400	GES.7057	Invalid graph flavor for scale-out.	Invalid graph flavor for resize.	**graphSizeTypeIndex** in the resize request body can be set to **2**, **3**, **4**, or **5**, indicating the ten-million-edge, hundred-million-edge, billion-edge, or ten-billion-edge graph.
400	GES.7059	The IaaS resources of the graph flavor to be scaled out are insufficient.	The IaaS resources of the graph flavor to be scaled out are insufficient.	Check whether the compute resources are sufficient. For details about the IaaS resources required by each GES flavor, see the LLD.
400	GES.7061	Failed to create the ECS because the resources are insufficient.	Failed to create the ECS because the resources are insufficient.	Check whether the compute resources are sufficient. For details about the IaaS resources required by each GES flavor, see the LLD.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.7062	Failed to create the data disk.	Failed to create the data disk.	Check the FusionStorage capacity or obtain the detailed error information from the returned **errorMessage**.
400	GES.7063	Failed to create the system disk.	Failed to create the system disk.	Check the FusionStorage capacity or obtain the detailed error information from the returned **errorMessage**.
400	GES.7064	Failed to create the ECS.	Failed to create the ECS.	See the returned **errorMessage** or download the microservice log on the management plane, search for the ID of failed task in the log, and contact IaaS O&M personnel.
400	GES.7065	Failed to query the image because the image does not exist.	Failed to query the image because the image does not exist.	Check whether the image ID configured on the GES management plane exists.
400	GES.7066	Failed to query the flavor.	Failed to query the flavor.	Check whether the flavor ID configured on the GES management plane exists.
400	GES.7067	Insufficient ECS quota.	Insufficient ECS quota.	Check whether the flavor ID configured on the GES management plane exists.
400	GES.7068	Invalid request parameters.	Invalid request parameters.	During graph creation, parameters in the request for calling the IaaS API are invalid. Obtain detailed information based on the returned error message for analysis.
400	GES.7069	The metadata file is too large.	The metadata file is too large.	The metadata file on OBS or that in the request body exceeds 10 MB.
400	GES.7070	Failed to parse the metadata file.	Failed to parse the metadata file.	When creating metadata, the metadata file on OBS or in the request body does not comply with the metadata standards. Create a metadata file or request body correctly.

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6.2.2 Error Codes for Service Plane APIs

If an error occurs in API calling, no result is returned. Identify the cause of error based on the error codes of each API. If an error occurs in API calling, HTTP status code 4xx or 5xx is returned. The response body contains the specific error code and information. If you fail to locate the cause of the error, contact technical support and provide the error code for troubleshooting.

Table 6-3 Error codes

Status Code	Error Code	Error Message	Description	Solution
400	GES.8000	Incorrect parameter format.	Incorrect parameter format.	Check whether the request body is the same as that described in the document.
400	GES.8001	Failed to query graph statistics.	Failed to query graph statistics.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
500	GES.8002	Graph statistics query error.	Graph statistics query error.	1. Check whether the token has expired. If it is expired, obtain a new one. 2. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8005	Incorrect parameter.	Incorrect parameter.	1. Check whether the project ID in the URL is correct. 2. Check whether the request header is correct, for example, whether **X-Auth-Token** is correct.
400	GES.8006	Invalid resource access.	Invalid resource access.	Check whether the project ID in the URL is correct.
400	GES.8007	Invalid token.	Invalid token.	Check whether the token is correct.
400	GES.8008	An error occurs in the underlying authentication system.	An error occurs in the underlying authentication system.	Try again later or contact technical support.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.8011	Failed to export a graph.	Failed to export a graph.	1. Check whether the graph name is correct. 2. Check whether the export path is correct. 3. Check whether the account has the OBS write permission.
400	GES.8012	Failed to clear a graph.	Failed to clear a graph.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8013	Failed to incrementally import data to the graph.	Failed to incrementally import data to the graph.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8020	The current user does not have permission.	The current user does not have the required permission for granular permission control.	Grant permissions as the Security Administrator.
400	GES.8101	Invalid filter criteria for edge queries.	Invalid filter criteria for edge queries.	Check whether format of the filter criteria for edge queries is correct.
400	GES.8102	Invalid label for edge filtering queries.	Invalid label for edge filtering queries.	Check whether the labels are in JSON format.
400	GES.8103	Both the condition and label of edge filtering queries are empty.	Both the condition and label of edge filtering queries are empty.	The condition and label of edge filtering queries cannot be both empty.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.8104	Invalid edge filtering query sequence.	Invalid edge filtering query sequence.	Check whether the edge filtering query sequence is valid.
400	GES.8105	Failed to query edges that meet filter criteria.	Failed to query edges that meet filter criteria.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8106	The source vertex or target vertex in the edge details is empty.	The source vertex or target vertex in the edge details is empty.	Ensure that the source vertex or target vertex in the edge details cannot be empty.
400	GES.8107	Failed to query edge details.	Failed to query edge details.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
500	GES.8108	Edge details query error.	Edge details query error.	Try again later or contact technical support.
400	GES.8109	Invalid edge filtering query operator.	Invalid edge filtering query operator.	Ensure that the values of edge filtering query operators are **in**, **out**, **both**, and **edge**.
400	GES.8110	Parameter edges cannot be left blank.	Parameter **edges** cannot be left blank.	Check whether the value of **edges** in the batch edge query request body is empty.
400	GES.8201	Invalid label for vertex filtering queries.	Invalid label for vertex filtering queries.	Check whether the labels are in JSON format.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.8202	Invalid filter criteria for vertex queries.	Invalid filter criteria for vertex queries.	1. Check whether **propertyName** of the vertex query API is left blank. 2. Check whether **values** of the vertex query API is left blank. 3. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8203	Both the condition and label of vertex filtering queries are empty.	Both the condition and label of vertex filtering queries are empty.	Ensure that the condition and label of vertex filtering queries are not both empty.
400	GES.8204	Failed to query vertices that meet filter criteria.	Failed to query vertices that meet filter criteria.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8205	Invalid vertex filtering query sequence.	Invalid vertex filtering query sequence.	In the vertex filtering query API, **orderValue** must be set to **incr** or **decr**.
400	GES.8206	Both vertexid and vertextids exist.	Both **vertexid** and **vertextids** exist.	**vertexid** and **vertextids** cannot coexist.
400	GES.8207	Both vertexid and vertextids are empty.	Both **vertexid** and **vertextids** are empty.	The **vertexid** or **vertextids** parameter is empty.
400	GES.8208	Incorrect vertextids format.	Incorrect **vertextids** format.	Check whether **vertextids** is a JSON array.
400	GES.8209	Failed to query vertex details.	Failed to query vertex details.	Check whether the graph name exists.

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Status Code	Error Code	Error Message	Description	Solution
500	GES.8210	Vertex details query error.	Vertex details query error.	Try again later or contact technical support.
400	GES.8211	Invalid vertex filtering query operator.	Invalid vertex filtering query operator.	Ensure that values of vertex filtering query operators are **inV**, **outV**, **bothV**, and **vertex**.
400	GES.8212	Failed to delete the vertex label.	Failed to delete the vertex label.	Check whether the label exists.
400	GES.8213	Failed to add the vertex label.	Failed to add the vertex label.	Check whether the label exists.
400	GES.8214	Parameter vertices cannot be left blank.	Parameter **vertices** cannot be left blank.	Check whether the value of vertices in the batch vertex query request body is empty.
400	GES.8220	Failed to update the vertex properties.	Failed to update the vertex properties.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8221	Failed to update the edge properties.	Failed to update the edge properties.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8301	Failed to query a job.	Failed to query a job.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
500	GES.8302	Job query error.	Job query error.	Try again later or contact technical support.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.8303	Failed to terminate a job.	Failed to terminate a job.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
500	GES.8304	Job termination error.	Job termination error.	Try again later or contact technical support.
400	GES.8401	The algorithm or graph name cannot be empty.	The algorithm or graph name cannot be empty.	Ensure that the algorithm or graph name in not empty.
400	GES.8402	Failed to run the algorithm.	Failed to run the algorithm.	1. If the network fluctuates, try again later. 2. Check whether the graph name in the algorithm running API is correct. 3. If the fault persists, report the error information in **errorMessage** to technical support.
500	GES.8403	Algorithm running error.	Algorithm running error.	Try again later or contact technical support.
400	GES.8404	Invalid algorithm running format.	Invalid algorithm running format.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8501	The Gremlin command is not supported.	The Gremlin command is not supported.	Replace the unsupported Gremlin statements: tryNext, explain, and tree.
400	GES.8502	Failed to find the Gremlin configuration file.	Failed to find the Gremlin configuration file.	Try again later or contact technical support.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.8503	Gremlin query failed.	Gremlin query failed.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
500	GES.8504	Gremlin query error.	Gremlin query error.	Try again later or contact technical support.
400	GES.8505	The Gremlin query statement does not contain the command field.	The Gremlin query statement does not contain the command field.	Ensure that the Gremlin query statement does not contain the command field.
400	GES.8506	The size of the Gremlin query request statements exceeds the upper limit.	The size of the Gremlin query request statements exceeds the upper limit.	The current limit is 64 MB.
500	GES.8601	Gremlin service unavailable.	Gremlin service unavailable.	Try again later or contact technical support.
500	GES.8602	Engine service unavailable.	Engine service unavailable.	Try again later or contact technical support.
400	GES.8603	Failed to create an index	Failed to create an index	1. Check whether the index name contains only letters, digits, hyphens (-), and underscores (_). 2. Check whether the index parameter type complies with that specified by the API.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.8604	Failed to delete an index	Failed to delete an index	1. Check whether the graph name is correct. 2. Check whether the index name is correct. 3. Check whether **Method type** of the request is **delete**.
400	GES.8605	Failed to query an index	Failed to query an index	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8609	The request body for querying path details is invalid.	The request body for querying path details is invalid.	1. Check whether the graph name is correct. 2. Check whether the parameter format of the API for querying path details is correct. 3. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8610	The path parameter of the request body for querying path details is invalid.	The **path** parameter of the request body for querying path details is invalid.	1. Check whether the parameter format of the API for querying path details is correct. 2. Check whether the mandatory parameters of the API for querying path details are set. 3. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8611	Failed to query path details.	Failed to query path details.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.

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Status Code	Error Code	Error Message	Description	Solution
400	GES.8612	The operation of querying path details is not supported.	The operation of querying path details is not supported.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.
400	GES.8801	Failed to add a label to metadata.	Failed to add a label to metadata.	1. Check whether the label to be added already exists. 2. Check whether the format of the parameter for adding the label is correct. 3. Check whether the mandatory parameters for adding the label are set.
400	GES.8803	Failed to query the metadata.	Failed to query the metadata.	1. Check whether the graph to be queried exists. 2. Check whether the value of **graph_name** in the API for querying graph metadata is correct.
500	GES.8804	Metadata query error.	Metadata query error.	Try again later or contact technical support.
400	GES.8806	K-Hop query with filter criteria failed.	K-Hop query with filter criteria failed.	1. If the network fluctuates, try again later. 2. If the fault persists, report the error information in **errorMessage** to technical support.

6.3 Obtaining a Project ID

Obtaining a Project ID by Calling an API

You can obtain a project ID by calling an API

For details about API authentication, see **Making a Management Plane API Request**.

The following is an example response. The value of **id** under **projects** is the project ID. The following is an example response. If GES is deployed in the *xxx* region, the value of **name** in the response body is *xxx*, and the value of **id** in **projects** is the project ID.

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```
{
    "projects": [
        {
            "domain_id": "65382450e8f64ac0870cd180d14e684b",
            "is_domain": false,
            "parent_id": "65382450e8f64ac0870cd180d14e684b",
            "name": "xxx",
            "description": "",
            "links": {
                "next": null,
                "previous": null,
                "self": "https://www.example.com/v3/projects/a4a5d4098fb4474fa22cd05f897d6b99"
            },
            "id": "a4a5d4098fb4474fa22cd05f897d6b99",
            "enabled": true
        }
    ],
    "links": {
        "next": null,
        "previous": null,
        "self": "https://www.example.com/v3/projects"
    }
}
```


Obtaining a Project ID from the Console

A project ID is required for some URIs when an API is called.

To obtain a project ID, perform the following operations:

1. Register an account and log in to the console.
2. In the upper right corner of the page, click the username and choose **My Credentials** from the drop-down list. The **My Credentials** page is displayed.

   NOTE

   If you have logged in to the official website but not the console, click your username in the upper right corner and choose **My Account** from the drop-down list. On the **Basic Information** page, click **Manage** following **Security Credentials**. Then, the **My Credentials** page is displayed.
3. On the **API Credentials** page, view the project ID and name in the **Projects** area.

   If there are multiple projects, unfold the target region and obtain the project ID from the **Project ID** column.

6.4 Obtaining the Account Name and Account ID

An account ID is required for some requests for calling APIs To obtain an account ID, perform the following operations:

1. Log in to the console.
2. Hover the cursor on the username and select **My Credentials** from the drop-down list.

   On the **API Credentials** page, view the account name and ID.

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