

Data Warehouse Service

API Reference

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1 Before You Start

1.1 Overview

Welcome to GaussDB(DWS). GaussDB(DWS) is a fully-managed and enterprise-level cloud data warehouse service. It is O&M-free, compatible with the PostgreSQL ecosystem, and supports online cluster scale-out and efficient loading of multiple data sources. GaussDB(DWS) helps enterprises efficiently analyze and monetize massive data online.

This document describes how to use application programming interfaces (APIs) to create, query, and delete GaussDB(DWS) clusters and snapshots. For details about all supported operations, see [API Overview](#).

Before calling an API, get familiar with related concepts of GaussDB(DWS). For details, see [Service Overview](#).

1.2 API Calling

GaussDB(DWS) supports representational state transfer (REST) APIs, allowing you to call APIs using HTTPS. For details, see [Calling APIs](#).

1.3 Endpoints

An endpoint is the **request address** for calling an API. Endpoints vary depending on services and regions. Obtain the regions and endpoints from the administrator.

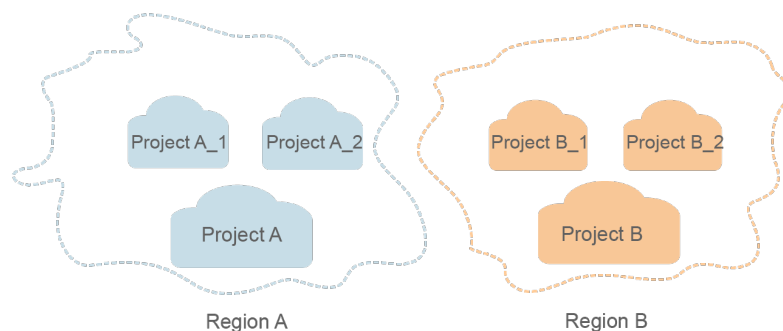
1.4 Constraints

- The number of DWS resources that you can create is determined by your quota. For details, see [Service Quota](#).
- For more constraints, see "API description".

1.5 Basic Concepts

- **Account**
An account is created upon successful registration with the cloud platform. The account has full access permissions for all of its cloud services and resources. It can be used to reset user passwords and grant user permissions. The account is a payment entity and should not be used directly to perform routine management. For security purposes, create users and grant them permissions for routine management.
- **Users**
An IAM user is created using an account for cloud services. Each IAM user has its own identity credentials (password and access keys).
The account name, username, and password will be required for API authentication.
- **Region**
A region is a geographic area in which cloud resources are deployed. Availability zones (AZs) in the same region can communicate with each other over an intranet, while AZs in different regions are isolated from each other. Deploying cloud resources in different regions can better suit certain user requirements or comply with local laws or regulations.
- **AZ**
An AZ contains one or more physical data centers. Each AZ has independent power and network devices. Within an AZ, computing, network, storage, and other resources are logically divided into multiple clusters. AZs within a region are interconnected using high-speed optical fibers to support cross-AZ high-availability systems.
- **Item**
Projects group and isolate resources (including compute, storage, and network resources) across physical regions. A default project is provided for each service 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. IAM users can then be assigned permissions to access only specific resources in the subprojects.

Figure 1-1 Project isolating model



- Enterprise project
Enterprise projects group and manage resources across regions. Resources in enterprise projects are logically isolated from each other. An enterprise project can contain resources of multiple regions, and resources can be added to or removed from enterprise projects.

2 API Overview

GaussDB(DWS) provides APIs developed by Huawei. You can use the following GaussDB(DWS) functions with the APIs.

Function	API	Description
Cluster management	Creating a Cluster	Creates a cluster.
	Querying the Cluster List	Queries and displays the cluster list.
	Querying Cluster Details	Queries cluster details.
	Querying the Supported Node Types	Queries all node types supported by GaussDB(DWS).
	Deleting a Cluster	Deletes a cluster.
	Restarting a Cluster	Restarts a cluster.
	Scaling Out Clusters	Scales out a cluster.
	Resetting a Password	Resets the cluster administrator password.
Snapshot management	Creating a Snapshot	Creates snapshots for a specified cluster.
	Querying the Snapshot List	Queries the snapshot list.
	Querying Snapshot Details	Queries the snapshot details using the snapshot ID.
	Deleting a Manual Snapshot	Deletes a snapshot.
	Restoring a Cluster	Restores a cluster using a snapshot.

3 Calling APIs

3.1 Making an API Request

This section describes the structure of a REST API request, and describes how to call an API by obtaining a user token of the IAM service. The obtained token can then be used to authenticate the calling of other APIs.

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.

Table 3-1 URI parameter description

Parameter	Description
URI-scheme	Protocol used to transmit requests. All APIs use HTTPS.
Endpoint	Domain name or IP address of the server bearing the REST service. The endpoint varies between services in different regions. It can be obtained from the administrator.
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 " <i>Parameter name=Parameter value</i> ". For example, ?limit=10 indicates that a maximum of 10 data records will be displayed.

 NOTE

To simplify the URI display in this document, each API is provided only with a **resource-path** and a request method. The **URI-scheme** of all APIs is **HTTPS**, and the endpoints of all APIs in the same region are identical.

Request Methods

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

Table 3-2 HTTP methods

Method	Description
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.

For example, in the case of the API used to obtain a user token, the request method is POST. The request is as follows:

```
POST https://{{endpoint}}/v3/auth/tokens
```

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.

For details about common request headers, see [Table 3-3](#).

Table 3-3 Common request header fields

Field	Description	Mandatory	Example
x-sdk-date	Time when the request is sent. Format: YYYYMMDD'T'HH MMSS'Z' The value is the current GMT time of the system.	No	20150907T101459Z
Host	Server information of the resource being requested. The value can be obtained from the URL of the service API. The value is in the format of <i>hostname[:port]</i> . If the port number is not specified, the default port is used. The default port number for HTTPS is 443 .	No	code.test.com or code.test.com:443
Content-Type	Request body MIME type. You are advised to use the default value application/json . For APIs used to upload objects or images, the value can vary depending on the flow type.	Yes	application/json
Content-Length	Length of the request body. The unit is byte.	No	3495
X-Project-id	Project ID. Obtain the project ID by following the instructions in Obtaining a Project ID .	No	e9993fc787d94b6c886cb aa340f9c0f4

Field	Description	Mandatory	Example
X-Auth-Token	User token. The user token is a response to the API used to obtain a user token. This API is the only one that does not require authentication. The X-Subject-Token value contained in the returned message header is the token.	No This parameter is mandatory for token-based authentication.	The following is part of an example token: MIIPAgYJKoZIhvcNAQc-Co...ggg1BBIINPXsidG9rZ
X-Language	Request language.	No	en_us

The API used to obtain a user token does not require authentication. Therefore, only the **Content-type** field needs to be added to requests for calling the API. An example of such requests is as follows:

```
POST https://{{endpoint}}/v3/auth/tokens
Content-type: application/json
```

Request Body

The body of a request is often sent in a structured format (JSON or XML) as specified in the **Content-type** header field. The request body transfers content except the request header. If the request body contains Chinese characters, these characters must be coded in UTF-8.

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.

In the case of the API used to obtain a user token, the request parameters and parameter description can be obtained from the API request. The following provides an example request with a body included. Replace **user_name**, **domainname** (account name), ********* (login password), and **XXXXXXXXXXXXXXXXXXXX** (project ID) with actual ones. Obtain the project ID from the administrator.

NOTE

The **scope** parameter specifies where a token takes effect. In the example, the token takes effect only on the resources specified by the project. In the following example, the token takes effect only for the resources in a specified project. For more information about this API, see Obtaining a User Token.

```
POST https://{{endpoint}}/v3/auth/tokens
Content-type: application/json
{
```

```
"auth": {
  "identity": {
    "methods": [
      "password"
    ],
    "password": {
      "user": {
        "name": "user_name",
        "password": "*****#",
        "domain": {
          "name": "domainname"
        }
      }
    }
  },
  "scope": {
    "project": {
      "id": "xxxxxxxxxxxxxxxxxxxxx"
    }
  }
}
```

If all data required for the API request is available, you can send the request to call the API through [curl](#), [Postman](#), or coding. In the response to the API used to obtain a user token, **x-subject-token** is the desired user token. This token can then be used to authenticate the calling of other APIs.

3.2 Authentication

Calling an API can 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 request headers to get permissions for calling the API.

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.

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": "user_name",
          "password": "*****#",
          "domain": {
            "name": "domainname"
          }
        }
      }
    }
  },
  "scope": {
```

```
"project": {  
  "id": "xxxxxxx"  
}
```

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.

3.3 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 Code](#).

For example, if status code **201** is returned for calling the API used to obtain a user token, the request is successful.

Response Header

Similar to a request, a response also has a header, for example, **Content-Type**.

Figure 3-1 shows the response header fields for the API used to obtain a user token. The **x-subject-token** header field is the desired user token. This token can then be used to authenticate the calling of other APIs.

Figure 3-1 Header fields of the response to the request for obtaining a user token

```
connection → keep-alive  
content-type → application/json  
date → Tue, 12 Feb 2019 06:52:13 GMT  
server → Web Server  
strict-transport-security → max-age=31536000; includeSubdomains;  
transfer-encoding → chunked  
via → proxy A  
x-content-type-options → nosniff  
x-download-options → noopen  
x-frame-options → SAMEORIGIN  
x-iam-trace-id → 218d45ab-d674-4995-af3a-2d0255ba41b5  
x-subject-token  
x-xss-protection → 1; mode=block;
```

Response Body

The body of a response is often returned in structured format (for example, JSON or XML) as specified in the **Content-type** header field. The response body transfers content except the response header.

The following is part of the response body for the API used to obtain a user token.

```
{
  "token": {
    "expires_at": "2019-02-13T06:52:13.855000Z",
    "methods": [
      "password"
    ],
    "catalog": [
      {
        "endpoints": [
          {
            "region_id": "eu-west-101",
            .....

```

If an error occurs during API calling, an error code and a message will be displayed. The following shows an error response body.

```
{
  "error_msg": "The format of message is error",
  "error_code": "AS.0001"
}
```

In the response body, **error_code** is an error code, and **error_msg** provides information about the error.

4 Getting Started

This section describes how to use GaussDB(DWS) APIs to manage clusters. The procedure of the management clusters is as follows:

1. Call the API in [Authentication](#) to obtain the user token, which will be put into the request header for authentication in a subsequent request.
2. Call the API in [Querying the Supported Node Types](#) to obtain the supported node types.
3. Call the API in [Creating a Cluster](#) to create a cluster.
4. Call the API in [Querying the Cluster List](#) to obtain the cluster information.
5. Call the API in [Querying Cluster Details](#) to view cluster details.
6. Call the API in [Creating a Snapshot](#) to create a snapshot.
7. Call the API in [Querying Snapshot Details](#) to check whether the snapshot is successfully created.
8. Call the API in [Restoring a Cluster](#) to restore a cluster using its snapshot.
9. Call the API in [Deleting a Manual Snapshot](#) to delete an unwanted snapshot.
10. Call the API in [Deleting a Cluster](#) to delete a finished or unwanted cluster.

Prerequisites

- You have created a VPC, subnet, and security group and obtained their IDs. For details, see [Creating a VPC](#).
- You have obtained the IAM and GaussDB(DWS) endpoints from the administrator.
- You have obtained the project ID. For details, see [Obtaining a Project ID](#).

Managing a Cluster

The following values are examples (replace them based on the actual situation).

- IAM endpoint: **iam_endpoint**
- GaussDB(DWS) endpoint: **dws_endpoint**
- VPC ID: **219ab8a0-1272-4049-a383-8ad0b770fa11**
- Subnet ID: **d23ef2e9-8b90-49b3-bc4a-fd7d6bea6bec**

- Security group ID: **12e3c23a-8710-4b75-95e4-5c8d7f68ef3c**
- Project ID: **9bc552e6-19af-4326-800d-281a92984636**

Perform the following operations to manage the cluster.

Step 1 Before calling other APIs, call the API in [Authentication](#) to obtain the token and set it as an environment variable.

```
curl -H "Content-type:application/json" https://{iam_endpoint}/v3/auth/tokens -X POST -d '{
  "auth": {
    "identity": {
      "methods": [
        "password"
      ],
      "password": {
        "user": {
          "name": "testname",
          "domain": {
            "name": "testname"
          },
          "password": "Passw0rd"
        }
      }
    },
    "scope": {
      "project": {
        "name": "eu-west-101"
      }
    }
  }
}' -v -k
```

1. Obtain the value of **X-Subject-Token** from the response header as follows. **X-Subject-Token** indicates the token.

```
X-Subject-Token:MlidkgYJKoZIhvcNAQcColidgzCCA38CAQExDTALBglghkgBZQMEAgEwgXXXXX...
```

2. Run the following command to set the token as an environment variable:

```
export Token={X-Subject-Token}
```

X-Subject-Token is the token obtained in the preceding step.

```
export Token=MlidkgYJKoZIhvcNAQcColidgzCCA38CAQExDTALBglghkgBZQMEAgEwgXXXXX...
```

Step 2 Call the API in [Querying the Supported Node Types](#) to obtain the supported node types.

```
curl -X GET -H 'Content-type:application/json;charset=utf-8' -H "X-Auth-Token:$Token" https://{dws_endpoint}/v1.0/9bc552e6-19af-4326-800d-281a92984636/node_types -v -k
```

The request response is as follows:

```
status CODE 200
{
  "node_types": [
    {
      "spec_name": "dws.d2.xlarge",
      "id": "ebe532d6-665f-40e6-a4d4-3c51545b6a67",
      "detail": [
        {
          "type": "vCPU",
          "value": "4"
        },
        {
          "value": "1675",
          "type": "LOCAL_DISK",
          "unit": "GB"
        },
        {
          "type": "mem",
          "value": "32",

```

```
        "unit": "GB"
      }
    ]
  },
  {
    "spec_name": "dws.m1.xlarge.ultrahigh",
    "id": "ebe532d6-665f-40e6-a4d4-3c51545b4f71",
    "detail": [
      {
        "type": "vCPU",
        "value": "4"
      },
      {
        "value": "512",
        "type": "SSD",
        "unit": "GB"
      },
      {
        "type": "mem",
        "value": "32",
        "unit": "GB"
      }
    ]
  }
]
}
```

Step 3 Call the API in [Creating a Cluster](#) to create a cluster.

The examples for configuring the cluster are as follows:

- Cluster name: **dws-demo**
- Administrator username: **dbadmin**
- Administrator password: **Dws2017demo!**
- Port: **8000**
- Node type: **dws.d1.xlarge**
- Number of nodes: **3**
- Elastic IP (EIP): **auto_assign**

```
curl -X POST -H 'Content-type:application/json;charset=utf-8' -H "X-Auth-Token:$Token" -d '{
  "node_type": "dws.d1.xlarge",
  "number_of_node": 3,
  "subnet_id": "d23ef2e9-8b90-49b3-bc4a-fd7d6bea6bec",
  "security_group_id": "12e3c23a-8710-4b75-95e4-5c8d7f68ef3c",
  "vpc_id": "219ab8a0-1272-4049-a383-8ad0b770fa11",
  "port": 8000,
  "name": "dws-demo",
  "user_name": "dbadmin",
  "user_pwd": "Dws2017demo!",
  "public_ip": {
    "public_bind_type": "auto_assign"
  }
}' https://{dws_endpoint}/v1.0/9bc552e6-19af-4326-800d-281a92984636/clusters -v -k
```

If status code **200** is returned, the request for creating a cluster is successfully sent.

Step 4 Call the API in [Querying the Cluster List](#) to obtain the cluster information.

```
curl -X GET -H 'Content-type:application/json;charset=utf-8' -H "X-Auth-Token:$Token" https://{dws_endpoint}/v1.0/9bc552e6-19af-4326-800d-281a92984636/clusters -k -v
```

The request response is as follows:

```
{
  "clusters": [
```

```
{
  "id": "7ba031f6-81f4-4670-ad20-c490b91877e5",
  "status": "AVAILABLE",
  "sub_status": "NORMAL",
  "task_status": null,
  "action_progress": null,
  "node_type": "dws.d1.xlarge",
  "subnet_id": "d23ef2e9-8b90-49b3-bc4a-fd7d6bea6bec",
  "security_group_id": "12e3c23a-8710-4b75-95e4-5c8d7f68ef3c",
  "number_of_node": 3,
  "availability_zone": "eu-west-101",
  "port": 8000,
  "name": "dws-demo",
  "version": "1.1.0",
  "vpc_id": "219ab8a0-1272-4049-a383-8ad0b770fa11",
  "user_name": "dbadmin",
  "public_ip": {
    "public_bind_type": "auto_assign",
    "eip_id": "85b20d7e-9eb7-4b2a-98f3-3c8843ea3574"
  },
  "public_endpoints": [
    {
      "public_connect_info": "dws-demo.eu-west-101.myhuaweicloud.com",
      "jdbc_url": "jdbc:postgresql://dws-demo.eu-west-101.myhuaweicloud.com/
<YOUR_DATABASE_name>"
    }
  ],
  "endpoints": [
    {
      "connect_info": "dws-demo.eu-west-101.myhuaweicloud.com",
      "jdbc_url": "jdbc:postgresql:///<YOUR_DATABASE_name>"
    }
  ],
  "updated": "2018-01-15T12:50:06",
  "created": "2018-01-15T12:50:06",
  "recent_event": 1
}
]
```

- If **status** is **CREATING**, the cluster is being created. If **status** is **AVAILABLE**, the cluster is successfully created.
- The UUID of cluster **dws-demo** is **7ba031f6-81f4-4670-ad20-c490b91877e5**. Record the UUID for subsequent use.

Step 5 Call the API in [Querying Cluster Details](#) to view cluster details.

```
curl -X GET -H "Content-type:application/json" -H "X-Auth-Token:$Token"
https://{dws_endpoint}/v1.0/9bc552e6-19af-4326-800d-281a92984636/clusters/7ba031f6-81f4-4670-
ad20-c490b91877e5 -k -v
```

The request response is as follows:

```
{
  "cluster": {
    "id": "7ba031f6-81f4-4670-ad20-c490b91877e5",
    "status": "AVAILABLE",
    "name": "dws-demo",
    "updated": "2018-01-15T12:50:06",
    "created": "2018-01-15T12:50:06",
    "user_name": "dbadmin",
    "sub_status": "NORMAL",
    "task_status": null,
    "action_progress": null,
    "node_type": "dws.d1.xlarge",
    "node_type_id": "5ddb1071-c5d7-40e0-a874-8a032e81a697",
    "subnet_id": "d23ef2e9-8b90-49b3-bc4a-fd7d6bea6bec",
    "security_group_id": "12e3c23a-8710-4b75-95e4-5c8d7f68ef3c",
    "number_of_node": 3,
  }
}
```

```
"availability_zone": "eu-west-101",
"port": 8000,
"vpc_id": "219ab8a0-1272-4049-a383-8ad0b770fa11",
"public_ip": {
  "public_bind_type": "auto_assign",
  "eip_id": "85b20d7e-9eb7-4b2a-98f3-3c8843ea3574"
},
"public_endpoints": [
  {
    "public_connect_info": "dws-demo.eu-west-101.myhuaweicloud.com",
    "jdbc_url": "jdbc:postgresql:///<YOUR_DATABASE_name>"
  }
],
"endpoints": [
  {
    "connect_info": "dws-demo.eu-west-101.myhuaweicloud.com",
    "jdbc_url": "jdbc:postgresql://dws-demo.eu-west-101.myhuaweicloud.com/
<YOUR_DATABASE_name>"
  }
],
"version": "1.1.0",
"maintain_window": {
  "day": "Wed",
  "start_time": "22:00",
  "end_time": "02:00"
},
"recent_event": 1,
"tags": null,
"parameter_group": {
  "id": "157e9cc4-64a8-11e8-adc0-fa7ae01bbebc",      "name": "Default-Parameter-Group-
dws ",      "status": "In-Sync"
}
}
```

public_endpoints and **endpoints** can be queried from the response. After the cluster is successfully created, you can use **public_endpoints** or **endpoints** to access the cluster from an external source.

Step 6 Call the API in [Creating a Snapshot](#) to create a snapshot.

Create snapshot **snapshotForDemoCluster** for cluster **dws-demo**.

```
curl -X POST -H "Content-type:application/json" -H "X-Auth-Token:$Token" -d '{
  "snapshot": {
    "name": "snapshotForDemoCluster",
    "cluster_id": "7ba031f6-81f4-4670-ad20-c490b91877e5",
    "description": "Snapshot description"
  }
}' https://{dws_endpoint}/v1.0/9bc552e6-19af-4326-800d-281a92984636/snapshots -k -v
```

The request response is as follows:

```
{
  "snapshot": {
    "id": "2a4d0f86-67cd-408a-8b66-017454fb7793"
  }
}
```

If status code **200** is returned, the request for creating a snapshot is successfully sent. Record **id** so that the ID can be used when you query the snapshot details later.

Step 7 Call the API in [Querying Snapshot Details](#) to check whether the snapshot is successfully created.

```
curl -X GET -H 'Content-type:application/json;charset=utf-8' -H "X-Auth-Token:$Token" https://
{dws_endpoint}/v1.0/9bc552e6-19af-4326-800d-281a92984636/snapshots/
2a4d0f86-67cd-408a-8b66-017454fb7793 -k -v
```

If the snapshot status in the response is **AVAILABLE**, the snapshot is successfully created. If the snapshot status is **CREATING**, the snapshot is being created.

```
{
  "snapshot": {
    "id": "2a4d0f86-67cd-408a-8b66-017454fb7793",
    "name": "snapshotForDemoCluster",
    "description": "Snapshot description",
    "started": "2018-01-18T13:59:23Z",
    "finished": "2018-01-18T13:01:40Z",
    "size": 500,
    "status": "AVAILABLE",
    "type": "MANUAL",
    "cluster_id": "4f87d3c4-9e33-482f-b962-e23b30d1a18c"
  }
}
```

Step 8 Call the API in [Restoring a Cluster](#) to restore a cluster using its snapshot.

Restore snapshot **snapshotForDemoCluster** to new cluster **dws-restore**.

```
curl -X POST -H 'Content-type:application/json;charset=utf-8' -H "X-Auth-Token:$Token" -d '{
  "restore": {
    "name": "dws-restore"
  }
}' https://{dws_endpoint}/v1.0/9bc552e6-19af-4326-800d-281a92984636/snapshots/
2a4d0f86-67cd-408a-8b66-017454fb7793/actions -v -k
```

If status code **200** is returned, the cluster is successfully restored. You can check the cluster restoration status by performing operations in [Querying Cluster Details](#).

Step 9 Call the API in [Deleting a Manual Snapshot](#) to delete an unwanted snapshot.

```
curl -X DELETE -H 'Content-type:application/json;charset=utf-8' -H "X-Auth-Token:$Token" https://
{dws_endpoint}/v1.0/9bc552e6-19af-4326-800d-281a92984636/snapshots/
2a4d0f86-67cd-408a-8b66-017454fb7793 -v -k
```

If status code **202** is returned, the snapshot is successfully deleted.

Step 10 Call the API in [Deleting a Cluster](#) to delete an unwanted cluster.

```
curl -X DELETE -H 'Content-type:application/json;charset=utf-8' -H "X-Auth-Token:$Token" -d '{
  "keep_last_manual_snapshot":0
}' https://{dws_endpoint}/v1.0/9bc552e6-19af-4326-800d-281a92984636/clusters/7ba031f6-81f4-4670-
ad20-c490b91877e5 -v -k
```

If status code **202** is returned, the cluster is successfully deleted.

----End

5 API Description

5.1 Cluster Management APIs

A data warehouse cluster is the smallest management unit in GaussDB(DWS). A cluster is a data warehouse that runs independently. You can manage the cluster life cycle in GaussDB(DWS).

5.1.1 Creating a Cluster

Function

This API is used to create clusters.

The cluster must run in a VPC. Before creating a cluster, you need to create a VPC and obtain the VPC and subnet IDs.

This API is an asynchronous API. It takes 10 to 15 minutes to create a cluster.

URI

- URI format
POST /v1.0/{project_id}/clusters
- Parameter description

Table 5-1 URI parameters

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

Request Message

- Request example
POST /v1.0/89cd04f168b84af6be287f71730fdb4b/clusters

```
{
  "cluster": {
    "node_type": "dws.d1.xlarge.ultrahigh",
    "number_of_node": 3,
    "subnet_id": "374eca02-cfc4-4de7-8ab5-dbebf7d9a720",
    "security_group_id": "dc3ec145-9029-4b39-b5a3-ace5a01f772b",
    "vpc_id": "85b20d7e-9eb7-4b2a-98f3-3c8843ea3574",
    "availability_zone": "eu-west-101",
    "port": 8000,
    "name": "dws-1",
    "user_name": "dbadmin",
    "user_pwd": "Password!",
    "public_ip": {
      "public_bind_type": "auto_assign",
      "eip_id": ""
    },
    "enterprise_project_id": "aca4e50a-266f-4786-827c-f8d6cc3fbada"
  }
}
```

- Parameter description

Table 5-2 Request parameters

Parameter	Mandatory	Type	Description
cluster	Yes	CreateClusterInfo object	Cluster object

Table 5-3 CreateClusterInfo

Parameter	Mandatory	Type	Description
node_type	Yes	String	Node type
number_of_node	Yes	Integer	Number of nodes in a cluster. Value range: 3 to 32
subnet_id	Yes	String	Subnet ID, which is used for configuring cluster network.
security_group_id	Yes	String	ID of a security group, which is used for configuring cluster network.
vpc_id	Yes	String	VPC ID, which is used for configuring cluster network.
availability_zone	No	String	AZ of a cluster
port	No	Integer	Service port of a cluster. The value ranges from 8000 to 30000. The default value is 8000 .

Parameter	Mandatory	Type	Description
name	Yes	String	Cluster name, which must be unique. The cluster name must contain 4 to 64 characters, which must start with a letter. Only letters, digits, hyphens (-), and underscores (_) are allowed.
user_name	Yes	String	Administrator username for logging in to a GaussDB(DWS) cluster. The administrator username must: <ul style="list-style-type: none"> • Consist of lowercase letters, digits, or underscores. • Start with a lowercase letter or an underscore. • Contain 1 to 63 characters. • Cannot be a keyword of the GaussDB(DWS) database.
user_pwd	Yes	String	Administrator password for logging in to a GaussDB(DWS) cluster
public_ip	No	PublicIp object	Public IP address. If the parameter is not specified, public connection is not used by default.
number_of_cn	No	Integer	Number of deployed CNs. The value ranges from 2 to the number of cluster nodes minus 1. The maximum value is 5 and the default value is 2 .
enterprise_project_id	No	String	Enterprise project. The default enterprise project ID is 0 .

Table 5-4 PublicIp

Parameter	Mandatory	Type	Description
public_bind_type	Yes	String	Binding type of an EIP. The value can be one of the following: <ul style="list-style-type: none"> • auto_assign • not_use • bind_existing
eip_id	No	String	EIP ID

Response Message

- Example response

```
{
  "cluster": {
    "id": "7d85f602-a948-4a30-afd4-e84f47471c15"
  }
}
```

- Parameter description

Table 5-5 Response parameters

Parameter	Type	Description
cluster	Cluster object	Cluster object

Table 5-6 Cluster

Parameter	Type	Description
id	String	Cluster ID

Status Code

- Normal
200
- Exception

Table 5-7 Returned values

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

Returned Value	Description
403 Forbidden	No operation permission.
404 Not Found	No resources found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	The service is unavailable.

5.1.2 Querying the Cluster List

Function

This API is used to query and display the cluster list.

URI

- URI format
GET /v1.0/{project_id}/clusters
- Parameter description

Table 5-8 URI parameters

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

Request

Request example

```
GET /v1.0/89cd04f168b84af6be287f71730fdb4b/clusters
```

Response

- Example response

```
{
  "clusters": [
    {
      "id": "7d85f602-a948-4a30-afd4-e84f47471c15",
      "status": "AVAILABLE",
      "sub_status": "READONLY",
      "task_status": "SNAPSHOTTING",
      "action_progress": {"SNAPSHOTTING": "20%"},
      "node_type": "dws.d1.xlarge.ultrahigh",
      "subnet_id": "374eca02-cfc4-4de7-8ab5-dbebf7d9a720",
      "security_group_id": "dc3ec145-9029-4b39-b5a3-ace5a01f772b",
      "number_of_node": 3,
      "availability_zone": "eu-west-101",
    }
  ]
}
```

```

    "port": 8000,
    "name": "dws-1",
    "version": "1.2.0",
    "vpc_id": "85b20d7e-9eb7-4b2a-98f3-3c8843ea3574",
    "user_name": "dbadmin",
    "public_ip": {
      "public_bind_type": "auto_assign",
      "eip_id": "85b20d7e-9eb7-4b2a-98f3-3c8843ea3574"
    },
    "public_endpoints": [
      {
        "public_connect_info": "dws-1.eu-west-101.myhuaweicloud.com",
        "jdbc_url": "jdbc:postgresql://dws-1.eu-west-101.myhuaweicloud.com/
<YOUR_DATABASE_name>"
      }
    ],
    "endpoints": [
      {
        "connect_info": "dws-1.eu-west-101.myhuaweicloud.com",
        "jdbc_url": "jdbc:postgresql://dws-1.eu-west-101.myhuaweicloud.com/
<YOUR_DATABASE_name>"
      }
    ],
    "updated": "2016-02-10T14:28:14Z",
    "created": "2016-02-10T14:26:14Z",
    "enterprise_project_id": "aca4e50a-266f-4786-827c-f8d6cc3fbada",
    "tags": [
      {
        "key": "key1",
        "value": "value1"
      },
      {
        "key": "key2",
        "value": "value2"
      }
    ],
    "recent_event": 6
  }
]

```

- Parameter description

Table 5-9 Response parameter description

Parameter	Type	Description
clusters	Array of ClusterInfo objects	List of cluster objects

Table 5-10 ClusterInfo

Parameter	Type	Description
id	String	Cluster ID

Parameter	Type	Description
status	String	<p>Cluster status. The value can be one of the following:</p> <ul style="list-style-type: none"> • CREATING • AVAILABLE • UNAVAILABLE • CREATION FAILED • FROZEN
sub_status	String	<p>Sub-status of clusters in the AVAILABLE state. The value can be one of the following:</p> <ul style="list-style-type: none"> • NORMAL • READONLY • REDISTRIBUTING • REDISTRIBUTION-FAILURE • UNBALANCED • UNBALANCED READONLY • DEGRADED • DEGRADED READONLY • DEGRADED UNBALANCED • UNBALANCED REDISTRIBUTING • UNBALANCED REDISTRIBUTION-FAILURE • READONLY REDISTRIBUTION-FAILURE • UNBALANCED READONLY REDISTRIBUTION-FAILURE • DEGRADED REDISTRIBUTION-FAILURE • DEGRADED UNBALANCED REDISTRIBUTION-FAILURE • DEGRADED UNBALANCED READONLY REDISTRIBUTION-FAILURE • DEGRADED UNBALANCED READONLY

Parameter	Type	Description
task_status	String	Cluster management task. The value can be one of the following: <ul style="list-style-type: none"> • UNFREEZING • FREEZING • RESTORING • SNAPSHOTTING • GROWING • REBOOTING • SETTING_CONFIGURATION • CONFIGURING_EXT_DATASOURCE • DELETING_EXT_DATASOURCE • REBOOT_FAILURE • RESIZE_FAILURE
action_progress	Map<String,String>	Task information, consisting of a key and a value. The key indicates an ongoing task, and the value indicates the progress of the ongoing task. Valid key values include: <ul style="list-style-type: none"> • GROWING • RESTORING • SNAPSHOTTING • REPAIRING • CREATING The following is an example: <pre>"action_progress": {"SNAPSHOTTING":"16%"}</pre>
node_type	String	Node type
subnet_id	String	Subnet ID
security_group_id	String	Security group ID
number_of_nodes	Integer	Number of nodes
availability_zone	String	AZ
port	Integer	Service port of a cluster. The value ranges from 8000 to 30000. The default value is 8000 .
name	String	Cluster name
version	String	Data warehouse version

Parameter	Type	Description
vpc_id	String	VPC ID
user_name	String	Username of the administrator
public_ip	PublicIp object	Public IP address. If the parameter is not specified, public connection is not used by default.
public_endpoints	PublicEndpoints object	Public network connection information about the cluster. If the parameter is not specified, the public network connection information is not used by default.
endpoints	Endpoints object	Private network connection information about the cluster.
updated	String	Last modification time of a cluster. Format: ISO8601:YYYY-MM-DDThh:mm:ssZ
created	String	Cluster creation time. Format: ISO8601:YYYY-MM-DDThh:mm:ssZ
enterprise_project_id	String	Enterprise project ID. The value 0 indicates the ID of the default enterprise project.
tags	Tags object	Tags in a cluster
recent_event	Integer	Number of events
failed_reasons	Object	Cause of failure. If the parameter is left empty, the cluster is in the normal state.

Table 5-11 PublicIp

Parameter	Mandatory	Type	Description
public_bind_type	Yes	String	Binding type of an EIP. The value can be one of the following: <ul style="list-style-type: none"> • auto_assign • not_use • bind_existing
eip_id	No	String	EIP ID

Table 5-12 Tags

Parameter	Type	Description
value	String	Value. A value can contain a maximum of 43 Unicode characters, which can be null. The first and last characters cannot be spaces. Only letters, digits, hyphens (-), and underscores (_) are allowed. It cannot contain the following characters: =*<>\\, /
key	String	Key. A key can contain a maximum of 36 Unicode characters, which cannot be null. The first and last characters cannot be spaces. Only letters, digits, hyphens (-), and underscores (_) are allowed. It cannot contain the following characters: =*<>\\, /

Table 5-13 PublicEndpoints

Parameter	Type	Description
public_connect_info	String	Public network connection information
jdbc_url	String	JDBC URL of the public network

Table 5-14 Endpoints

Parameter	Mandatory	Type	Description
connect_info	Yes	String	Private network connection information
jdbc_url	Yes	String	JDBC URL on the private network. The following is the default format: jdbc:postgresql://< connect_info>/<YOUR_DATABASE_name>

Returned Value

- Normal
200
- Exception

Table 5-15 Returned values

Returned Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permission.
404 Not Found	No resources found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	The service is unavailable.

5.1.3 Querying Cluster Details

Function

This API is used to query cluster details.

URI

- URI format
GET /v1.0/{project_id}/clusters/{cluster_id}
- Parameter description

Table 5-16 URI parameters

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

Request Message

Request example

GET /v1.0/89cd04f168b84af6be287f71730fdb4b/clusters/b5c45780-1006-49e3-b2d5-b3229975bbc7

Response Message

- Example response


```
{
  "cluster": {
    "id": "7d85f602-a948-4a30-afd4-e84f47471c15",
    "status": "AVAILABLE",
    "name": "dws-1",
    "updated": "2018-02-10T14:28:14Z",
    "created": "2018-02-10T14:28:14Z",
    "user_name": "dbadmin",
    "sub_status": "READONLY",
    "task_status": "SNAPSHOTTING",
    "action_progress": {"SNAPSHOTTING": "20%"},
    "node_type": "dws.m1.xlarge.ultrahigh",

    "subnet_id": "374eca02-cfc4-4de7-8ab5-dbebf7d9a720",
    "security_group_id": "dc3ec145-9029-4b39-b5a3-ace5a01f772b",
    "number_of_node": 3,
    "availability_zone": "eu-west-101",
    "port": 8000,
    "vpc_id": "85b20d7e-9eb7-4b2a-98f3-3c8843ea3574",
    "public_ip": {
      "public_bind_type": "auto_assign",
      "eip_id": "85b20d7e-9etypeb2a-98f3-3c8843ea3574"
    },
    "private_ip": ["192.168.0.12", "192.168.0.66"],
    "public_endpoints": [
      {
        "public_connect_info": "dws-1.eu-west-101.myhuaweicloud.com",
        "jdbc_url": "jdbc:postgresql://dws-1.eu-west-101.myhuaweicloud.com/
<YOUR_DATABASE_name>"
      }
    ],
    "endpoints": [
      {
        "connect_info": "dws-1.eu-west-101.myhuaweicloud.com",
        "jdbc_url": "jdbc:postgresql://dws-1.eu-west-101.myhuaweicloud.com/
<YOUR_DATABASE_name>"
      }
    ],
    "version": "1.2.0",
    "maintain_window": {
      "day": "Wed",
      "start_time": "22:00",
      "end_time": "02:00"
    },
    "resize_info": {
      "target_node_num": "6",
      "origin_node_num": "3",
      "resize_status": "GROWING",
      "start_time": "2018-02-14T14:28:14Z"
    },
    "enterprise_project_id": "6a6a18fe-417a-4188-9214-75fd08c22065",
    "recent_event": 6,
    "tags": [
      {
        "key": "key1",
        "value": "value1"
      },
      {
        "key": "key2",
        "value": "value2"
      }
    ],
    "parameter_group": {
      "id": "157e9cc4-64a8-11e8-adc0-fa7ae01bbebc",
      "name": "Default-Parameter-Group-dws ",
      "status": "In-Sync"
    }
  }
}
```

- Parameter description

Table 5-17 Response parameter description

Parameter	Type	Description
cluster	ClusterDetail object	Cluster object

Table 5-18 ClusterDetail

Parameter	Type	Description
id	String	Cluster ID
status	String	Cluster status. The value can be one of the following: <ul style="list-style-type: none"> • CREATING • AVAILABLE • UNAVAILABLE • CREATION FAILED • FROZEN
name	String	Cluster name
updated	String	Last modification time of a cluster. Format: ISO8601:YYYY-MM-DDThh:mm:ssZ
created	String	Cluster creation time. Format: ISO8601: YYYY-MM-DDThh:mm:ssZ
user_name	String	Username of the administrator

Parameter	Type	Description
sub_status	String	<p>Sub-status of clusters in the AVAILABLE state. The value can be one of the following:</p> <ul style="list-style-type: none"> • NORMAL • READONLY • REDISTRIBUTING • REDISTRIBUTION-FAILURE • UNBALANCED • UNBALANCED READONLY • DEGRADED • DEGRADED READONLY • DEGRADED UNBALANCED • UNBALANCED REDISTRIBUTING • UNBALANCED REDISTRIBUTION-FAILURE • READONLY REDISTRIBUTION-FAILURE • UNBALANCED READONLY REDISTRIBUTION-FAILURE • DEGRADED REDISTRIBUTION-FAILURE • DEGRADED UNBALANCED REDISTRIBUTION-FAILURE • DEGRADED UNBALANCED READONLY REDISTRIBUTION-FAILURE • DEGRADED UNBALANCED READONLY

Parameter	Type	Description
task_status	String	Cluster management task. The value can be one of the following: <ul style="list-style-type: none"> • UNFREEZING • FREEZING • RESTORING • SNAPSHOTTING • GROWING • REBOOTING • SETTING_CONFIGURATION • CONFIGURING_EXT_DATASOURCE • DELETING_EXT_DATASOURCE • REBOOT_FAILURE • RESIZE_FAILURE
action_progress	Map<String,String>	The key indicates an ongoing task. The value can be one of the following: <ul style="list-style-type: none"> • GROWING • RESTORING • SNAPSHOTTING • REPAIRING • CREATING The value indicates the task progress.
node_type	String	Node type
subnet_id	String	Subnet ID
security_group_id	String	Security group ID
number_of_node	Integer	Number of nodes
availability_zone	String	AZ
port	Integer	Service port of a cluster. The value ranges from 8000 to 30000. The default value is 8000 .
vpc_id	String	VPC ID

Parameter	Type	Description
public_ip	PublicIp object	Public IP address. If the parameter is not specified, public connection is not used by default.
private_ip	Array of strings	List of private network IP addresses
public_endpoints	Array of PublicEndpoints objects	Public network connection information about the cluster. If the parameter is not specified, the public network connection information is not used by default.
endpoints	Array of Endpoints objects	Private network connection information about the cluster.
version	String	Data warehouse version
maintain_window	MaintainWindow object	Cluster maintenance window
resize_info	ResizeInfo object	Cluster scale-out details
enterprise_project_id	String	Enterprise project ID. The value 0 indicates the ID of the default enterprise project.
recent_event	Integer	Number of events
tags	Array of Tags objects	Labels in a cluster
parameter_group	ParameterGroup object	Parameter group details
node_type_id	String	Node type ID
failed_reasons	Object	Cause of failure. If the parameter is left empty, the cluster is in the normal state.

Table 5-19 PublicIp

Parameter	Mandatory	Type	Description
public_bind_type	Yes	String	Binding type of an EIP. The value can be one of the following: <ul style="list-style-type: none"> • auto_assign • not_use • bind_existing
eip_id	No	String	EIP ID

Table 5-20 PublicEndpoints

Parameter	Mandatory	Type	Description
public_connect_info	No	String	Public network connection information
jdbc_url	No	String	JDBC URL of the public network. The following is the default format: jdbc:postgresql://<public_connect_info>/<YOUR_DATABASE_name>

Table 5-21 Endpoints

Parameter	Mandatory	Type	Description
connect_info	Yes	String	Private network connection information
jdbc_url	Yes	String	JDBC URL on the private network. The following is the default format: jdbc:postgresql://<connect_info>/<YOUR_DATABASE_name>

Table 5-22 MaintainWindow

Parameter	Mandatory	Type	Description
day	No	String	Maintenance time in each week in the unit of day. The value can be one of the following: <ul style="list-style-type: none"> • Mon • Tue • Wed • Thu • Fri • Sat • Sun
start_time	No	String	Maintenance start time in HH:mm format. The time zone is GMT+0.
end_time	No	String	Maintenance end time in HH:mm format. The time zone is GMT+0.

Table 5-23 ResizeInfo

Parameter	Type	Description
target_node_num	Integer	Number of nodes after the scale-out
origin_node_num	Integer	Number of nodes before the scale-out
resize_status	String	Scale-out status. The value can be one of the following: <ul style="list-style-type: none"> • GROWING • RESIZE_FAILURE
start_time	String	Scale-out start time. Format: ISO8601:YYYY-MM-DDThh:mm:ss

Table 5-24 Tags

Parameter	Type	Description
key	String	Key. A key can contain a maximum of 36 Unicode characters, which cannot be null. The first and last characters cannot be spaces. Only letters, digits, hyphens (-), and underscores (_) are allowed. It cannot contain the following characters: =*<>\\, /
value	String	Value. A value can contain a maximum of 43 Unicode characters, which can be null. The first and last characters cannot be spaces. Only letters, digits, hyphens (-), and underscores (_) are allowed. It cannot contain the following characters: =*<>\\, /

Table 5-25 ParameterGroup

Parameter	Mandatory	Type	Description
id	Yes	String	Parameter group ID
name	Yes	String	Parameter group name
status	Yes	String	Cluster parameter status. The value can be one of the following: <ul style="list-style-type: none"> • In-Sync: synchronized • Applying: in application • Pending-Reboot: restart for the modification to take effect • Sync-Failure: application failure

Status Code

- Normal
200
- Exception

Table 5-26 Returned values

Returned Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permission.

Returned Value	Description
404 Not Found	No resources found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	The service is unavailable.

5.1.4 Querying the Supported Node Types

Function

This API is used to query the node types supported by GaussDB(DWS).

URI

- URI format
GET /v2/{project_id}/node-types

Table 5-27 URI parameters

Parameter	Man dato ry	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the ID, see Obtaining a Project ID .

Request Message

- Request example
GET /v2/89cd04f168b84af6be287f71730fdb4b/node-types

Response Message

- Example response
status CODE 200

```
{
  "node_types": [
    {
      "spec_name": "dws.d2.xlarge",
      "id": "ebe532d6-665f-40e6-a4d4-3c51545b6a67",
      "detail": [
        {
          "type": "vCPU",
          "value": "4"
        },
        {
          "value": "1675",
          "type": "LOCAL_DISK",
          "unit": "GB"
        },
        {
          "type": "mem",
```

```

        "value": "32",
        "unit": "GB"
      }
    ]
  },
  {
    "spec_name": "dws.m1.xlarge.ultrahigh",
    "id": "ebe532d6-665f-40e6-a4d4-3c51545b4f71",
    "detail": [
      {
        "type": "vCPU",
        "value": "4"
      },
      {
        "value": "512",
        "type": "SSD",
        "unit": "GB"
      },
      {
        "type": "mem",
        "value": "32",
        "unit": "GB"
      }
    ]
  }
]
}

```

- Parameter description

Table 5-28 Response parameter description

Parameter	Type	Description
node_types	Array of NodeTypes objects	List of node type objects

Table 5-29 NodeTypes

Parameter	Type	Description
spec_name	String	Name of a node type
detail	Detail object	Node type details
id	String	Node type ID

Table 5-30 Detail

Parameter	Type	Description
type	String	Attribute type
value	String	Attribute value
unit	String	Attribute unit

Status Code

- Normal
200
- Exception

Table 5-31 Returned values

Returned Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permission.
404 Not Found	No resources found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	The service is unavailable.

5.1.5 Deleting a Cluster

Function

This API is used to delete clusters. All resources of the deleted cluster, including customer data, will be released. For data security, create a snapshot for the cluster that you want to delete before deleting the cluster.

URI

- URI format
`DELETE /v1.0/{project_id}/clusters/{cluster_id}`
- Parameter description

Table 5-32 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the ID, see Obtaining a Project ID .
cluster_id	Yes	String	ID of the cluster to be deleted. For details about how to obtain the ID, see Obtaining the Cluster ID .

Request Message

- Request example

```
DELETE /v1.0/89cd04f168b84af6be287f71730fdb4b/clusters/4ca46bf1-5c61-48ff-b4f3-0ad4e5e3ba90
{
  "keep_last_manual_snapshot":0
}
```

- Parameter description

Table 5-33 Request parameters

Parameter	Mandatory	Type	Description
keep_last_manual_snapshot	Yes	Integer	Number of snapshots that you want to reserve for a cluster.

Response Message

Example response

```
status CODE 202
```

Status Code

- Normal
202
- Exception

Table 5-34 Returned values

Returned Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permission.
404 Not Found	No resources found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	The service is unavailable.

5.1.6 Restarting a Cluster

Function

This API is used to restart clusters.

URI

- URI format
POST /v1.0/{project_id}/clusters/{cluster_id}/restart
- Parameter description

Table 5-35 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the ID, see Obtaining a Project ID .
cluster_id	Yes	String	ID of the cluster to be restarted. For details about how to obtain the ID, see Obtaining the Cluster ID .

Request Message

- Request example
POST /v1.0/89cd04f168b84af6be287f71730fdb4b/clusters/4ca46bf1-5c61-48ff-b4f3-0ad4e5e3ba90/restart

```
{
  "restart":{}
}
```
- Parameter description

Table 5-36 Request parameters

Parameter	Mandatory	Type	Description
restart	Yes	Object	Restart flag.

Response Message

Example response

status CODE 200

Status Code

- Normal
200
- Exception

Table 5-37 Returned values

Returned Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permission.
404 Not Found	No resources found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	The service is unavailable.

5.1.7 Scaling Out Clusters

Function

This API is used to scale out clusters.

URI

- URI format
POST /v1.0/{project_id}/clusters/{cluster_id}/resize
- Parameter description

Table 5-38 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the ID, see Obtaining a Project ID .
cluster_id	Yes	String	ID of the cluster to be scaled out. For details about how to obtain the ID, see Obtaining the Cluster ID .

Request Message

- Request example
scale_out sample API is as follows:

```
POST /v1.0/89cd04f168b84af6be287f71730fdb4b/clusters/4ca46bf1-5c61-48ff-b4f3-0ad4e5e3ba90/resize
{
  "scale_out":{
    "count":3
  }
}
```

- Parameter description

Table 5-39 Request parameters

Parameter	Mandatory	Type	Description
scale_out	No	ScaleOut object	Scale out an object.

Table 5-40 ScaleOut

Parameter	Mandatory	Type	Description
count	Yes	Integer	Number of nodes to be added

Response Message

Example response

status CODE 200

Status Code

- Normal
200
- Exception

Table 5-41 Returned values

Returned Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permission.
404 Not Found	No resources found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	The service is unavailable.

5.1.8 Resetting a Password

Function

This API is used to reset the password of cluster administrator.

URI

- URI format
POST /v1.0/{project_id}/clusters/{cluster_id}/reset-password
- Parameter description

Table 5-42 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the ID, see Obtaining a Project ID .
cluster_id	Yes	String	ID of the cluster whose password is to be reset. For details about how to obtain the ID, see Obtaining the Cluster ID .

Request Message

- Request example
POST /v1.0/89cd04f168b84af6be287f71730fdb4b/clusters/4ca46bf1-5c61-48ff-b4f3-0ad4e5e3ba90/reset-password
{
 "new_password": "NewPassword!"
}
- Parameter description

Table 5-43 Request parameters

Parameter	Mandatory	Type	Description
new_password	Yes	String	<p>New administrator password for logging in to a data warehouse cluster</p> <p>A password must conform to the following rules:</p> <ul style="list-style-type: none"> • Contains 8 to 32 characters. • Cannot be the same as the username or the username written in reverse order. • Contains at least three types of the following: <ul style="list-style-type: none"> - Lowercase letters - Uppercase letters - Digits - Special characters: ~!?,.,:;-_'(){}[]/<>@#%^&*+ \= • Cannot be the same as previous passwords. • Cannot be a weak password.

Response Message

Example response

status CODE 200

Status Code

- Normal
200
- Exception

Table 5-44 Returned values

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

Returned Value	Description
503 Service Unavailable	The service is unavailable.

5.2 Snapshot Management APIs

A GaussDB(DWS) snapshot is a complete backup of a cluster. Snapshots are stored in the storage space of Object Storage Service (OBS). A snapshot can be used to restore a cluster to a newly created one that has the same flavor. Currently, you can only restore a cluster to a new one.

5.2.1 Creating a Snapshot

Function

This API is used to create snapshots for a specified cluster.

URI

- URI format
POST /v1.0/{project_id}/snapshots
- Parameter description

Table 5-45 URI parameters

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

Request Message

- Request example
POST /v1.0/89cd04f168b84af6be287f71730fdb4b/snapshots

```
{
  "snapshot": {
    "name": "snapshot-3",
    "cluster_id": "44b277eb-39be-4921-be31-3d61b43651d7",
    "description": "Snapshot-3 description"
  }
}
```
- Parameter description

Table 5-46 Request parameters

Parameter	Mandatory	Type	Description
snapshot	Yes	Snapshot object	Snapshot object.

Table 5-47 Snapshot

Parameter	Mandatory	Type	Description
name	Yes	String	Snapshot name, which must be unique and start with a letter. It consists of 4 to 64 characters. The value is case-insensitive and can contain letters, digits, hyphens (-), and underscores (_) only.
cluster_id	Yes	String	ID of the cluster for which you want to create a snapshot. For details about how to obtain the ID, see Obtaining the Cluster ID .
description	No	String	Snapshot description. If no value is specified, the description is empty. Enter a maximum of 256 characters. The following special characters are not allowed: ! <>'=&"

Response Message

- Example response

```
status CODE 200
{
  "snapshot": {
    "id": "2a4d0f86-67cd-408a-8b66-017454fb7793"
  }
}
```

- Parameter description

Table 5-48 Response parameter description

Parameter	Type	Description
snapshot	SnapshotRes p object	Snapshot object

Table 5-49 SnapshotResp

Parameter	Type	Description
id	String	Snapshot ID

Status Code

- Normal
200
- Exception

Table 5-50 Returned values

Returned Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permission.
404 Not Found	No resources found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	The service is unavailable.

5.2.2 Querying the Snapshot List

Function

This API is used to query the snapshot list.

URI

- URI format
GET /v1.0/{project_id}/snapshots
- Parameter description

Table 5-51 URI parameters

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

Request Message

Request example

```
GET /v1.0/89cd04f168b84af6be287f71730fdb4b/snapshots
```

Response Message

- Example response

```
status CODE 200
{
  "snapshots": [
    {
      "id": "2a4d0f86-67cd-408a-8b66-017454fb7793",
      "name": "snapshot-1",
      "description": "",
      "started": "2016-08-23T03:59:23Z",
      "finished": "2016-08-23T04:01:40Z",
      "size": 500,
      "status": "AVAILABLE",
      "type": "MANUAL",
      "cluster_id": "4f87d3c4-9e33-482f-b962-e23b30d1a18c"
    },
    {
      "id": "4af11460-06ec-48a4-b3ad-0e3bbdcd8ab1",
      "name": "snapshot-2",
      "description": "",
      "started": "2016-08-23T18:20:00Z",
      "finished": "2016-08-23T18:22:12Z",
      "size": 500,
      "status": "AVAILABLE",
      "type": "MANUAL",
      "cluster_id": "4f87d3c4-9e33-482f-b962-e23b30d1a18c"
    }
  ],
  "count": 2
}
```

- Parameter description

Table 5-52 Response parameter description

Parameter	Type	Description
snapshots	Array of Snapshots objects	List of snapshot objects
count	Integer	Total number of snapshot objects

Table 5-53 Snapshots

Parameter	Type	Description
id	String	Snapshot ID
name	String	Snapshot name
description	String	Snapshot description

Parameter	Type	Description
started	String	Time when a snapshot starts to be created. Format: ISO8601: YYYY-MM-DDThh:mm:ssZ
finished	String	Time when a snapshot is complete. Format: ISO8601: YYYY-MM-DDThh:mm:ssZ
size	Double	Snapshot size, in GB
status	String	Snapshot status: <ul style="list-style-type: none">• CREATING• AVAILABLE• UNAVAILABLE
type	String	Snapshot type
cluster_id	String	ID of the cluster for which snapshots are created For details about how to obtain the ID, see Obtaining the Cluster ID .

Status Code

- Normal
200
- Exception

Table 5-54 Returned values

Returned Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permission.
404 Not Found	No resources found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	The service is unavailable.

5.2.3 Querying Snapshot Details

Function

This API is used to query snapshot details by using the snapshot ID.

URI

- URI format
GET /v1.0/{project_id}/snapshots/{snapshot_id}
- Parameter description

Table 5-55 URI parameters

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

Request Message

Request example

```
GET /v1.0/89cd04f168b84af6be287f71730fdb4b/snapshots/b5c45780-1006-49e3-b2d5-b3229975bbc7
```

Response Message

- Example response
status CODE 200

```
{
  "snapshot": {
    "id": "2a4d0f86-67cd-408a-8b66-017454fb7793",
    "name": "snapshot-1",
    "description": "snapshot description",
    "started": "2016-08-23T03:59:23Z",
    "finished": "2016-08-23T04:01:40Z",
    "size": 500,
    "status": "AVAILABLE",
    "type": "MANUAL",
    "cluster_id": "4f87d3c4-9e33-482f-b962-e23b30d1a18c"
  }
}
```
- Parameter description

Table 5-56 Response parameter description

Parameter	Type	Description
snapshot	SnapshotDetail object	Snapshot object

Table 5-57 SnapshotDetail

Parameter	Type	Description
id	String	Snapshot ID
name	String	Snapshot name
description	String	Snapshot description
started	String	Time when a snapshot starts to be created. Format: ISO8601: YYYY-MM-DDThh:mm:ssZ
finished	String	Time when a snapshot is complete. Format: ISO8601: YYYY-MM-DDThh:mm:ssZ
size	Double	Snapshot size, in GB
status	String	Snapshot status: <ul style="list-style-type: none"> • CREATING • AVAILABLE • UNAVAILABLE
type	String	Snapshot type
cluster_id	String	ID of the cluster for which snapshots are created For details about how to obtain the ID, see Obtaining the Cluster ID .

Status Code

- Normal
200
- Exception

Table 5-58 Returned values

Returned Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permission.
404 Not Found	No resources found.

Returned Value	Description
500 Internal Server Error	Internal service error.
503 Service Unavailable	The service is unavailable.

5.2.4 Deleting a Manual Snapshot

Function

This API is used to delete a specified manual snapshot.

URI

- URI format
DELETE /v1.0/{project_id}/snapshots/{snapshot_id}
- Parameter description

Table 5-59 URI parameters

Parameter	Man dato ry	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the ID, see Obtaining a Project ID .
snapshot_id	Yes	String	Snapshot ID

Request Message

Request example

```
DELETE /v1.0/89cd04f168b84af6be287f71730fdb4b/snapshots/4ca46bf1-5c61-48ff-b4f3-0ad4e5e3ba90
```

Response Message

Example response

```
status CODE 202
```

Status Code

- Normal
202
- Exception

Table 5-60 Returned values

Returned Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permission.
404 Not Found	No resources found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	The service is unavailable.

5.2.5 Restoring a Cluster

Function

This API is used to restore clusters using the snapshot.

URI

- URI format
POST /v1.0/{project_id}/snapshots/{snapshot_id}/actions
- Parameter description

Table 5-61 URI parameters

Parameter	Mandatory	Type	Description
project_id	Yes	String	Project ID. For details about how to obtain the ID, see Obtaining a Project ID .
snapshot_id	Yes	String	ID of the snapshot to be restored

Request Message

- Request example
POST /v1.0/89cd04f168b84af6be287f71730fdb4b/snapshots/4ca46bf1-5c61-48ff-b4f3-0ad4e5e3ba90/actions
{
 "restore": {
 "name": "dws-1",
 "subnet_id": "374eca02-cfc4-4de7-8ab5-dbebf7d9a720",
 "security_group_id": "dc3ec145-9029-4b39-b5a3-ace5a01f772b",
 "vpc_id": "85b20d7e-9eb7-4b2a-98f3-3c8843ea3574",
 "availability_zone": "eu-west-101",
 "port": 8000,
 "public_ip": {

```

    "public_bind_type": "auto_assign",
    "eip_id": ""
  },
  "enterprise_project_id": "aca4e50a-266f-4786-827c-f8d6cc3fbada"
}

```

- Parameter description

Table 5-62 Request parameters

Parameter	Mandatory	Type	Description
restore	Yes	Restore object	Object to be restored

Table 5-63 Restore

Parameter	Mandatory	Type	Description
name	Yes	String	Cluster name, which must be unique. The cluster name must contain 4 to 64 characters, which must start with a letter. Only letters, digits, hyphens (-), and underscores (_) are allowed.
subnet_id	No	String	Subnet ID, which is used for configuring cluster network. The default value is the same as that of the original cluster.
security_group_id	No	String	Security group ID, which is used for configuring cluster network. The default value is the same as that of the original cluster.

Parameter	Mandatory	Type	Description
vpc_id	No	String	VPC ID, which is used for configuring cluster network. The default value is the same as that of the original cluster.
availability_zone	No	String	AZ of a cluster. The default value is the same as that of the original cluster.
port	No	Integer	Service port of a cluster. The value ranges from 8000 to 30000.
public_ip	No	PublicIp object	Public IP address. If the parameter is not specified, public connection is not used by default.
enterprise_project_id	No	String	Enterprise project. The default enterprise project ID is 0 .

Table 5-64 PublicIp

Parameter	Mandatory	Type	Description
public_bind_type	Yes	String	Binding type of an EIP. The value can be one of the following: <ul style="list-style-type: none"> • auto_assign • not_use • bind_existing
eip_id	No	String	EIP ID

Response Message

- Example response

```
{
  "cluster": {
    "id": "7d85f602-a948-4a30-afd4-e84f47471c15"
  }
}
```

- Parameter description

Table 5-65 Response parameter description

Parameter	Type	Description
cluster	Cluster object	Cluster object

Table 5-66 Cluster

Parameter	Type	Description
id	String	Cluster ID

Status Code

- Normal
200
- Exception

Table 5-67 Returned values

Returned Value	Description
400 Bad Request	Request error.
401 Unauthorized	Authorization failed.
403 Forbidden	No operation permission.
404 Not Found	No resources found.
500 Internal Server Error	Internal service error.
503 Service Unavailable	The service is unavailable.

6 Application Cases

6.1 Using Postman to Call the API for Creating a Snapshot

Scenarios

Use Postman to call the API for creating a snapshot. For details, see [Calling APIs](#).

Involved APIs

When this API is called, authentication is required. The following APIs are involved:

- **Authentication:** This API is used to authenticate identity to obtain the permission to operate APIs.
- **Creating a Snapshot:** This API is used to create a snapshot for a cluster.

Procedure

Step 1 Configure the environment.

 **NOTE**

Download Postman (7.24.0 is recommended) and call the snapshot creation service.

Step 2 Call services.

1. Obtain the token for authentication.

Create a POST request on Postman, select the Body configuration item, and enter the username, password, account name, and project ID. For details about how to obtain the project ID, see [Obtaining a Project ID](#).

 **NOTE**

The region where the cloud service for obtaining the token is located must be the same as the region where the called service is located. Otherwise, the calling fails.

2. Click **Send** in the upper right corner to send **POST https://{{endpoint}}/v3/auth/tokens**. Obtain the token value in the returned result. The token validity period is 24 hours.

3. Call the API for creating a snapshot.
 - Create a POST request on Postman, select **Headers**, add the corresponding KEY and VALUE, and copy the token value to **X-Auth-Token**. The region in the request URL must be the same as that of the invoked service. You can obtain the region from "Regions and Endpoints".
 - Click **Body** and add the request parameter values to the request. Parameters vary by services. For details, see the [API Description](#).
 - Click **Send** in the upper right corner to send **POST https://dws.cn-north-4.myhuaweicloud.com/v1.0/{project_id}/snapshots** and view the creation result.

```
{
  "snapshot": {
    "id": "809bcf6e-4022-496d-9320-bbc700695692"
  }
}
```

----End

7 Permissions Policies and Supported Actions

This section describes fine-grained permissions management for your GaussDB(DWS) service using IAM. You can skip this section if your HUAWEI CLOUD account already satisfies your needs.

By default, new IAM users do not have permissions assigned. You need to add the users to one or more groups, and attach permissions policies or roles to these groups. Users inherit permissions from the groups to which they are added and can perform specified operations on cloud services based on the permissions.

You can grant users permissions by using roles and policies. Roles are provided by IAM to define service-based permissions depending on users' job responsibilities. Policies define API-based permissions for operations on specific resources under certain conditions, allowing for more fine-grained, secure access control of cloud resources.

NOTE

Policy-based authorization is useful if you want to allow or deny the access to an API.

An account has all of the permissions required to call all APIs, but IAM users must have the required permissions specifically assigned. The permissions required for calling an API are determined by the actions supported by the API. Only users who have been granted permissions allowing the actions can call the API successfully. For example, if an IAM user wants to query the GaussDB(DWS) cluster list using an API, the user must have been granted permissions that allow the **dws:openAPICluster:list** action.

Supported Actions

DWS provides system-defined policies that can be directly used in IAM. You can also create custom policies and use them to supplement system-defined policies, implementing more refined access control. Actions supported by policies are specific to APIs. The following are common concepts related to policies:

- **Permissions:** Allow or deny operations on specified resources under specific conditions.
- **APIs:** RESTful APIs that can be called in a custom policy.

- **Actions:** Added to a custom policy to control permissions for specific operations.
- **IAM or enterprise projects:** Type of projects for which an action will take effect. Policies that contain actions supporting both IAM and enterprise projects can be assigned to user groups and take effect in both IAM and Enterprise Management. Policies that only contain actions supporting IAM projects can be assigned to user groups and only take effect for IAM. Such policies will not take effect if they are assigned to user groups in Enterprise Management.

 **NOTE**

The check mark (√) indicates that an action takes effect. The cross mark (x) indicates that an action does not take effect.

GaussDB(DWS) supports the following actions that can be defined in custom policies:

- [Managing Clusters](#)
- [Managing Snapshots](#)

Managing Clusters

Permissions	APIs	Actions	IAM Project	Enterprise Project
Creating clusters	POST /v1.0/{project_id}/clusters	dws:openAPICluster:create	√	x
Querying the cluster list	GET /v1.0/{project_id}/clusters	dws:openAPICluster:list	√	x
Querying cluster details	GET /v1.0/{project_id}/clusters/{cluster_id}	dws:openAPICluster:getDetail	√	x
Querying the node type	GET /v1.0/{project_id}/node_types	dws:openAPIFlavors:get	√	x
Deleting clusters	DELETE /v1.0/{project_id}/clusters/{cluster_id}	dws:openAPICluster:delete	√	x
Restarting clusters	POST /v1.0/{project_id}/clusters/{cluster_id}/restart	dws:openAPICluster:restart	√	x

Permissions	APIs	Actions	IAM Project	Enterprise Project
Scales out a cluster.	POST /v1.0/{project_id}/clusters/{cluster_id}/resize	dws:openAPICluster:resize	√	x
Resetting the cluster's administrator password	POST /v1.0/{project_id}/clusters/{cluster_id}/reset_password	dws:openAPICluster:resetPassword	√	x

Managing Snapshots

Permissions	APIs	Actions	IAM Project	Enterprise Project
Creating snapshots	POST /v1.0/{project_id}/snapshots	dws:openAPISnapshot:create	√	x
Querying the snapshot list	GET /v1.0/{project_id}/snapshots	dws:openAPISnapshot:list	√	x
Querying snapshot details	GET /v1.0/{project_id}/snapshots/{snapshot_id}	dws:openAPISnapshot:getDetail	√	x
Deleting snapshots	DELETE /v1.0/{project_id}/snapshots/{snapshot_id}	dws:openAPISnapshot:delete	√	x
Restoring clusters	POST /v1.0/{project_id}/snapshots/{snapshot_id}/actions	dws:openAPISnapshot:restore	√	x

8 Appendix

8.1 Status Code

[Table 8-1](#) describes the status code.

Table 8-1 Status code

Status Code	Code	Description
100	Continue	The client continues sending the request. This interim response is used to inform the client that the initial part of the request has been received and has not yet been rejected by the server.
101	Switching Protocols	Switching protocols. The target protocol must be more advanced than the source protocol. For example, the current HTTP protocol is switched to a later version.
201	Created	The request for creating a resource has been fulfilled.
202	Accepted	The request has been accepted, but the processing has not been completed.
203	Non-Authoritative Information	The server successfully processed the request, but is returning information that may be from another source.
204	NoContent	The server has successfully processed the request, but has not returned any content. The status code is returned in response to an HTTP OPTIONS request.

Status Code	Code	Description
205	Reset Content	The server has fulfilled the request, but the requester is required to reset the content.
206	Partial Content	The server has processed certain GET requests.
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 the user or user agent (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	Retrieve a location. 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. When the server returns this status code, it does not return any resources.
305	Use Proxy	The requested resource must be accessed through a proxy.
306	Unused	The HTTP status code is no longer used.
400	BadRequest	Invalid request. The client should not repeat the request without modifications.
401	Unauthorized	The 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.
403	Forbidden	The server understood the request, but is refusing to fulfill it. The client should not repeat the request without modifications.
404	NotFound	The requested resource cannot be found. The client should not repeat the request without modifications.

Status Code	Code	Description
405	MethodNotAllowed	The method specified in the request is not supported for the requested resource. The client should not repeat the request without modifications.
406	Not Acceptable	The server cannot fulfill the request according to the content characteristics of the request.
407	Proxy Authentication Required	This status code is similar to 401, but indicates that the client must first authenticate itself with the proxy.
408	Request Time-out	The request timed out. The client may repeat the request without modifications at any later time.
409	Conflict	The request could not be completed due to a conflict with the current state of the resource. This status code indicates that the resource that the client attempts to create already exists, or the request fails to be processed because of the update of the conflict request.
410	Gone	The requested resource is no longer available. The status code indicates that the requested resource has been deleted permanently.
411	Length Required	The server refuses 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.
413	Request Entity Too Large	The request is larger than that a server is able to process. The server may close the connection to prevent the client from continuing the request. If the server cannot process the request temporarily, the response will contain a Retry-After header field.
414	Request-URI Too Large	The URI provided was too long for the server to process.
415	Unsupported Media type	The server is unable to process the media format in the request.
416	Requested range not satisfiable	The requested range is invalid.
417	Expectation Failed	The server fails to meet the requirements of the Expect request-header field.

Status Code	Code	Description
422	UnprocessableEntity	The request is well-formed but is unable to be processed due to semantic errors.
429	TooManyRequests	The client has sent more requests than its rate limit is allowed within a given amount of time, or the server has received more requests than it is able to process within a given amount of time. In this case, it is advisable for the client to re-initiate requests after the time specified in the Retry-After header of the response expires.
500	InternalServerError	The server is able to receive the request but it could not understand the request.
501	Not Implemented	The server does not support the requested function.
502	Bad Gateway	The server is acting as a gateway or proxy and receives an invalid request from a remote server.
503	ServiceUnavailable	The requested service is invalid. The client should not repeat the request without modifications.
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.

8.2 Error Code

No data is returned if an API fails to be called. You can locate the cause of error according to the error code of each API. When the calling fails, HTTP status code 4xx or 5xx is returned. The returned message body contains the specific error code and error information. If you fail to locate the cause of error, contact the and technical support and provide the error code so that we can help you solve the problem as soon as possible.

Table 8-2 Error code

Stat us Cod e	Error Code	Error Information	Description	Solution
400	DWS.0001	Incorrect parameter.	Incorrect parameter.	Enter the correct parameter according to the corresponding parameter description and try again later.
500	DWS.0005	Server failure.	Server failure.	Contact the or try again later.
400	DWS.0006	The request is empty. Enter a request parameter.	The request is empty. Enter a request parameter.	Enter the request parameter and try again later.
409	DWS.0011	This operation cannot be performed because another operation is being performed on the instance or the instance is faulty. Please try again later.	This operation cannot be performed because another operation is being performed on the instance or the instance is faulty. Please try again later.	Try again later. If the error persists, contact the .
403	DWS.0015	Resource not found or permission denied.	Resource not found or permission denied.	Verify the access resources and access permissions and try again later.
403	DWS.0020	Restricted account.	Restricted account.	Contact the .
403	DWS.0021	Frozen account.	Frozen account.	The account may be frozen due to insufficient balance. Renew the account and try again.
404	DWS.0022	The instance does not exist or has been deleted.	The instance does not exist or has been deleted.	Enter a correct instance and try again later.
400	DWS.0030	The number of snapshots reaches the quota.	The number of snapshots reaches the quota.	Apply for a larger quota or delete unnecessary snapshots and try again.

Status Code	Error Code	Error Information	Description	Solution
400	DWS.0031	The object already exists.	The object already exists.	Enter a correct object and try again later.
403	DWS.0032	You are not authorized to perform the operation. Check the account permission on the IAM.	You are not authorized to perform the operation. Check the account permission on the IAM.	Check your account permissions on IAM.
404	DWS.0047	The cluster does not exist or has been deleted.	The cluster does not exist or has been deleted.	Verify the cluster and cluster status and try again later.
400	DWS.0048	The cluster does not support the operation.	The cluster does not support the operation.	Verify the cluster and cluster status and try again later.
400	DWS.1102	The instance name already exists.	The instance name already exists.	Enter a correct instance and try again later.
400	DWS.1112	The number of instances reaches the quota.	The number of instances reaches the quota.	Apply for a larger quota or delete unnecessary clusters and try again.
400	DWS.2026	This is a weak password. Enter a strong password.	This is a weak password. Enter a strong password.	Enter a valid password according to the password description.
400	DWS.2067	The input parameter is illegal.	The input parameter is illegal.	Enter the correct parameter according to the corresponding parameter description and try again later.
400	DWS.2072	The new password must be different from the current password.	The new password must be different from the current password.	Enter a password that is different from the current password.

Stat us Cod e	Error Code	Error Information	Description	Solution
400	DWS. 2073	A historical password cannot be used again.	A historical password cannot be used again.	Enter a password that is different from historical passwords.
400	DWS. 3026	The backup file does not exist.	The backup file does not exist.	Ensure that the backup file is correct and try again later.
400	DWS. 3027	The cluster does not exist.	The cluster does not exist.	Ensure that the cluster is correct and try again later.
400	DWS. 3029	The backup file of a specific time point does not exist.	The backup file of a specific time point does not exist.	Ensure that the backup file is correct and try again later.
400	DWS. 3030	The volume size of the new instance should not be less than that of the original one.	The volume size of the new instance should not be less than that of the original one.	Rectify the fault according to the prompted error message and try again later.
400	DWS. 5001	Invalid instance name.	Invalid instance name.	Enter a valid instance name according to the instance name description and try again later.
400	DWS. 5002	Invalid database type.	Invalid database type.	Enter a valid database type according to the database parameter description and try again later.
400	DWS. 5003	Invalid database version.	Invalid database version.	Enter a valid database version according to the database parameter description and try again later.
400	DWS. 5004	Empty datastore field.	Empty datastore field.	Enter the correct datastore according to the actual situation and try again later.

Stat us Cod e	Error Code	Error Information	Description	Solution
400	DWS. 5005	Database type or version not supported.	Database type or version not supported.	Enter a valid database type and version according to the database parameter description and try again later.
400	DWS. 5006	Invalid flavor.	Invalid flavor.	Select the correct flavor and try again later.
400	DWS. 5007	The selected flavor does not exist.	The selected flavor does not exist.	Select the correct flavor and try again later.
400	DWS. 5013	Invalid password of database root .	Invalid password of database root .	Enter a valid password according to the password description.
400	DWS. 5014	Invalid VPC ID.	Invalid VPC ID.	Enter a valid ID according to the description of parameter vpc_id .
400	DWS. 5015	Invalid subnet ID.	Invalid subnet ID.	Enter a valid ID according to the description of parameter subnet_id .
400	DWS. 5016	Invalid security group ID.	Invalid security group ID.	Enter a valid ID according to the description of the security group ID parameter.
400	DWS. 5017	Invalid retention period of automated backups.	Invalid retention period of automated backups.	Enter a proper retention period and try again later.
400	DWS. 5018	Invalid automated backup period.	Invalid automated backup period.	Enter a proper automated backup period and try again later.
400	DWS. 5020	The time when automated backup starts is invalid.	The time when automated backup starts is invalid.	Enter a proper automated backup start time and try again later.
404	DWS. 5021	The VPC does not exist or does not belong to the user.	The VPC does not exist or does not belong to the user.	Enter a correct VPC and try again later.

Stat us Cod e	Error Code	Error Information	Description	Solution
404	DWS. 5022	The subnet does not exist or does not belong to the VPC.	The subnet does not exist or does not belong to the VPC.	Enter a correct subnet and try again later.
404	DWS. 5023	The security group does not exist or does not belong to the VPC.	The security group does not exist or does not belong to the VPC.	Enter a correct security group and try again later.
400	DWS. 5026	Illegal AZ.	Illegal AZ.	Enter a correct AZ and try again later.
400	DWS. 5027	Invalid AZ.	Invalid AZ.	Enter a correct AZ and try again later.
400	DWS. 5045	The current tenant is not allowed to perform this operation.	The current tenant is not allowed to perform this operation.	Ensure that the current tenant is the same as the tenant to which the cluster belongs and try again.
400	DWS. 5046	This operation cannot be performed because another operation is being performed on the cluster or a node in the cluster is faulty. Please try again later.	This operation cannot be performed because another operation is being performed on the cluster or a node in the cluster is faulty. Please try again later.	Try again later. If the error persists, contact the .
400	DWS. 5047	Invalid instance quantity.	Invalid instance quantity.	Enter a correct instance quantity.
400	DWS. 5048	Invalid extended parameter.	Invalid extended parameter.	Enter a valid extended parameter according to the corresponding description of the extended parameter.
400	DWS. 5049	Invalid cluster name.	Invalid cluster name.	Enter a valid cluster name according to the cluster name description.

Status Code	Error Code	Error Information	Description	Solution
409	DWS.5050	The cluster name already exists.	The cluster name already exists.	Enter a correct cluster name and try again later.
400	DWS.5052	Invalid value of the AZ.	Invalid value of the AZ.	Enter a correct AZ and try again later.
400	DWS.5053	The value of locality between instances is invalid.	The value of locality between instances is invalid.	Enter a correct locality value and try again later.
400	DWS.5054	The parameter group ID is invalid.	The parameter group ID is invalid.	Enter a correct parameter group ID and try again later.
400	DWS.5055	The flavor ID is invalid.	The flavor ID is invalid.	Enter a correct flavor ID and try again later.
400	DWS.5057	The cluster name pattern is invalid.	The cluster name pattern is invalid.	Enter a valid cluster name according to the cluster name description.
400	DWS.5059	Database username contains invalid characters.	Database username contains invalid characters.	Enter a valid database username according to the database username description.
400	DWS.5060	Integer type is of wrong range.	Integer type is of wrong range.	Enter a valid Integer type and try again later.
400	DWS.5061	The volume type is illegal.	The volume type is illegal.	Enter a valid volume type and try again later.
400	DWS.5062	The volume tag is illegal.	The volume tag is illegal.	Enter a valid volume tag and try again later.
400	DWS.5063	Invalid Specific field.	Invalid Specific field.	Enter a correct Specific value and try again later.
400	DWS.5068	Invalid disk parameters.	Invalid disk parameters.	Enter correct disk parameters and try again later.
400	DWS.5070	Flavor ref is invalid in xml.	Flavor ref is invalid in xml.	Enter correct flavor ref and try again later.
400	DWS.5071	The volume type is invalid in XML.	The volume type is invalid in XML.	Enter a correct disk type and try again later.

Stat us Cod e	Error Code	Error Information	Description	Solution
400	DWS. 5072	The security group ID is invalid.	The security group ID is invalid.	Enter a valid security group ID and try again later.
400	DWS. 5074	The subnet does not belong to the VPC.	The subnet does not belong to the VPC.	Enter a correct subnet and try again later.
400	DWS. 5079	The backup period is not permitted.	The backup period is not permitted.	Enter a proper backup period and try again later.
400	DWS. 5080	The backup retention period is not permitted.	The backup retention period is not permitted.	Enter a proper backup retention duration and try again later.
400	DWS. 5082	Database user is not supported.	Database user is not supported.	Enter a valid database username according to the database username description.
400	DWS. 5084	Incorrect volume configuration in the XML file.	Incorrect volume configuration in the XML file.	Enter a correct volume value and try again later.
400	DWS. 5086	The same instance type does not meet flavor consistency requirements.	The same instance type does not meet flavor consistency requirements.	Enter the correct flavor and try again later.
400	DWS. 5087	The same instance type does not meet disk consistency requirements.	The same instance type does not meet disk consistency requirements.	Enter a correct disk and try again later.
400	DWS. 5093	Flavor information is invalid.	Flavor information is invalid.	Enter valid flavor information and try again later.
400	DWS. 5096	Invalid disk quantity.	Invalid disk quantity.	Enter valid disk quantity and try again later.
400	DWS. 5097	Region or AZ does not exist.	Region or AZ does not exist.	Enter a correct region or AZ and try again later.

Stat us Cod e	Error Code	Error Information	Description	Solution
400	DWS. 5098	Invalid EIP binding type.	Invalid EIP binding type.	Enter a correct EIP binding type and try again later.
400	DWS. 5106	Invalid instance type.	Invalid instance type.	Enter a valid instance type and try again later.
400	DWS. 5107	Invalid cluster mode.	Invalid cluster mode.	Enter a valid disk mode and try again later.
400	DWS. 5110	Parameter groups of instances of the same type are inconsistent.	Parameter groups of instances of the same type are inconsistent.	Enter the correct parameter group and try again later.
400	DWS. 5111	The backup file ID does not exist.	The backup file ID does not exist.	Enter a correct backup file ID and try again later.
400	DWS. 5144	Invalid password of the cluster administrator.	Invalid password of the cluster administrator.	Enter a valid cluster administrator password according to the description of the cluster administrator's password.
400	DWS. 5145	The administrator password cannot contain the username or the reverse username.	The administrator password cannot contain the username or the reverse username.	Enter a valid administrator password as prompted and try again later.
400	DWS. 5149	The snapshot ID is invalid.	The snapshot ID is invalid.	Enter a valid snapshot ID according to the snapshot ID description.
400	DWS. 5165	Invalid null content in the data file.	Invalid null content in the data file.	Enter the correct control content and try again later.
400	DWS. 5166	Invalid noescaping parameter in text format	Invalid noescaping parameter in text format	Enter the correct noescaping parameter and try again later.

Stat us Cod e	Error Code	Error Information	Description	Solution
400	DWS. 5167	Invalid header parameter in the data file. The supported values are true/on and false/off.	Invalid header parameter in the data file. The supported values are true/on and false/off.	Enter the correct header parameter and try again later.
400	DWS. 5168	Invalid fill_missing_fields parameter in the data file. The supported values are true/on and false/off .	Invalid fill_missing_fields parameter in the data file. The supported values are true/on and false/off .	Enter the correct fill_missing_fields parameter and try again later.
400	DWS. 5169	Invalid ignore_extra_data parameter in the data file. The supported values are true/on and false/off .	Invalid ignore_extra_data parameter in the data file. The supported values are true/on and false/off .	Enter the correct ignore_extra_data parameter and try again later.
400	DWS. 5170	Invalid number of incorrect data formats during data import.	Invalid number of incorrect data formats during data import.	Enter the correct number of incorrect data formats and try again later.
400	DWS. 5171	Invalid username or password for logging in to the database.	Invalid username or password for logging in to the database.	Enter the correct username or password and try again later.
400	DWS. 5172	The database does not exist.	The database does not exist.	Enter the correct database name and try again later.
400	DWS. 5173	The schema where the database table resides does not exist.	The schema where the database table resides does not exist.	Enter a correct schema and try again later.
400	DWS. 5174	The database table does not exist.	The database table does not exist.	Enter the correct database table and try again later.

Stat us Cod e	Error Code	Error Information	Description	Solution
400	DWS. 5175	The database username cannot be blank.	The database username cannot be blank.	Enter the username and try again later.
400	DWS. 5176	The password corresponding to the database username cannot be blank.	The password corresponding to the database username cannot be blank.	Enter the password and try again later.
400	DWS. 5177	Name of the database where the table to which data is loaded is located cannot be blank.	Name of the database where the table to which data is loaded is located cannot be blank.	Enter the database name and try again later.
400	DWS. 5178	Schema where the table to which data is loaded is located cannot be blank.	Schema where the table to which data is loaded is located cannot be blank.	Enter the schema and try again later.
400	DWS. 5179	Database table to which data is loaded cannot be blank.	Database table to which data is loaded cannot be blank.	Enter the database table and try again later.
400	DWS. 5180	Invalid path for OBS file loading.	Invalid path for OBS file loading.	Enter a correct OBS loading path and try again later.
400	DWS. 5181	Failed to load data. The error information is #failedReason#.	Failed to load data. The error information is #failedReason#.	Rectify the fault according to the error information and try again later.
400	DWS. 5182	The current job is stopped.	The current job is stopped.	Select a loading job and cancel it.
400	DWS. 5183	The current job has been canceled.	The current job has been canceled.	Select a loading job and cancel it.

Stat us Cod e	Error Code	Error Information	Description	Solution
400	DWS. 5184	Invalid format of the data source file. The supported file formats are CSV and TEXT.	Invalid format of the data source file. The supported file formats are CSV and TEXT.	Enter a correct data source file format and try again later. The supported file formats are CSV and TEXT.
400	DWS. 5185	Invalid encoding format of the data file. The supported file formats are GBK, UTF8, Latin1, and SQL_ASCII.	Invalid encoding format of the data file. The supported file formats are GBK, UTF8, Latin1, and SQL_ASCII.	Enter a correct encoding format and try again later. The supported file formats are GBK, UTF8, Latin1, and SQL_ASCII.
400	DWS. 5186	Invalid field delimiter of row data in a data source file.	Invalid field delimiter of row data in a data source file.	Enter a correct field delimiter and try again later.
400	DWS. 5187	Invalid quote character for a CSV file.	Invalid quote character for a CSV file.	Enter a correct quote character and try again later.
400	DWS. 5188	Invalid escape character for a CSV file.	Invalid escape character for a CSV file.	Enter a correct escape character and try again later.
400	DWS. 5189	Failed to obtain the AK/SK.	Failed to obtain the AK/SK.	Contact the or try again later.
400	DWS. 5191	The tag does not exist.	The tag does not exist.	Enter the correct tag and try again later.
400	DWS. 5194	The number of tags exceeds the maximum value.	The number of tags exceeds the maximum value.	Verify the number of tags for the resource and try again later.
400	DWS. 5197	The tag is invalid.	The tag is invalid.	Enter the correct tag and try again later.
400	DWS. 5200	The flavor has been sold out. Switch to another AZ or region.	The flavor has been sold out. Switch to another AZ or region.	Create a cluster of another flavor or switch to another AZ or region.

Status Code	Error Code	Error Information	Description	Solution
400	DWS.5206	Databases of this version do not support the function.	Databases of this version do not support the function.	Ensure that the API parameters match the cluster version. If the parameters do not match the version, correct the parameters and try again.
400	DWS.6000	Cluster creation fails.	Cluster creation fails.	Check the account's remaining quota. If it is greater than the amount of resources requested by the user, contact the .
400	DWS.6001	Cluster scale-out failed.	Cluster scale-out failed.	Check the account's remaining quota of nodes. If it is greater than the number of nodes to be added, contact the .
400	DWS.6002	Cluster restart failed.	Cluster restart failed.	Contact the or try again later.
400	DWS.6003	Cluster restoration failed.	Cluster restoration failed.	Check the account's remaining quota. If it is greater than the requested quota, contact the .
500	DWS.9999	Request processing failed.	Request processing failed.	Contact the or try again later.

8.3 Creating a VPC

Background

Before creating a cluster, you need to create a VPC to provide a secure and isolated network environment for using GaussDB(DWS).

If you have already created a VPC, you do not need to create it again.

NOTE

For details about how to create a VPC, see the "Creating a VPC" section in the *Virtual Private Cloud User Guide*.

Procedure

- Step 1** Log in to the management console.
- Step 2** Under **Network**, click **Virtual Private Cloud**.
- Step 3** On the **Virtual Private Cloud** page, click **Create VPC** to create a VPC.
- Step 4** Obtain the VPC and subnet ID for subsequent use in [Creating a Cluster](#).
- Step 5** On the **Virtual Private Cloud** page, choose **Access Control > Security Groups** in the navigation tree on the left, and click **Create Security Group** to create a security group.
- Step 6** Obtain the security group ID for subsequent use in [Creating a Cluster](#).

----End

8.4 Obtaining a Project ID

Obtaining a Project ID by Calling the API

A project ID can also be obtained by calling a specific API. For details, see "Querying Project Information".

The API used to obtain a project ID is **GET https://{Endpoint}/v3/projects/{Endpoint}**. *{Endpoint}* indicates the IAM endpoint and can be obtained from "Regions and Endpoints". For details about API authentication, see [Authentication](#).

The following is an example response. The value of **id** of **projects** indicates the project ID.

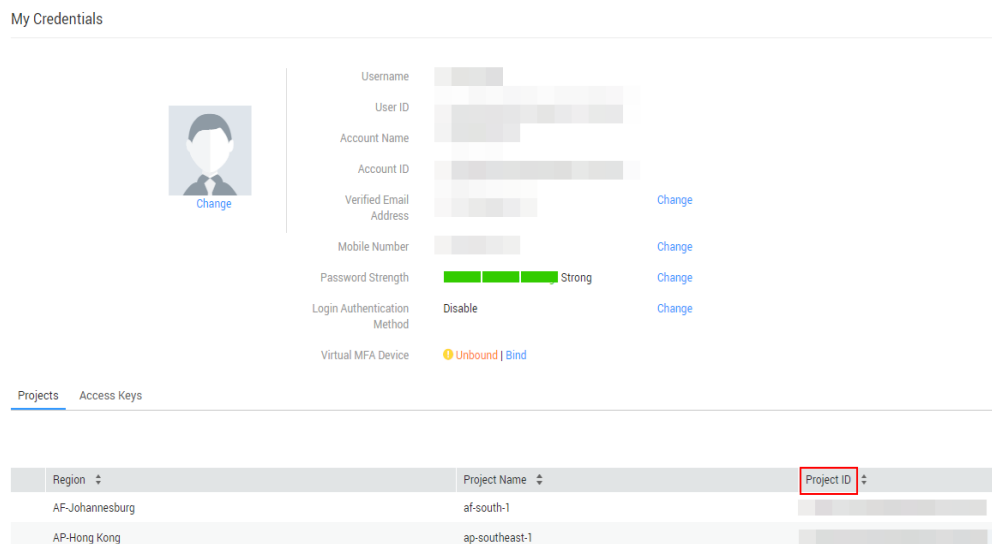
```
{
  "projects": [
    {
      "domain_id": "65382450e8f64ac0870cd180d14e684b",
      "is_domain": false,
      "parent_id": "65382450e8f64ac0870cd180d14e684b",
      "name": "eu-west-101",
      "description": "",
      "links": {
        "next": null,
        "previous": null,
        "self": "https://www.example.com/v3/projects/a4a5d4098fb4474fa22cd05f897d6b99"
      },
      "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 URLs when an API is called. To obtain a project ID, perform the following operations:

1. Log in to the management console.
2. Click the username and select **Basic Information** from the drop-down list.
3. On the **Account Info** page, click **Manage**.
On the **My Credentials** page, view project IDs in the project list.

Figure 8-1 Viewing project IDs

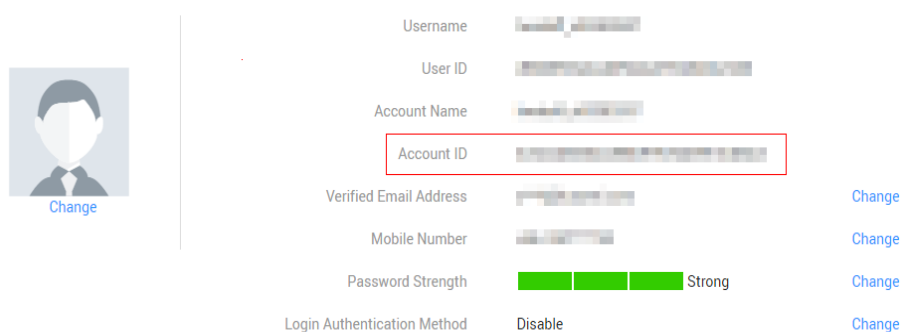


8.5 Obtaining an Account ID

An account ID is required for some URLs when an API is called. To obtain the account ID, perform the following steps:

1. Log in to the management console.
2. Click the username and select **My Credential** from the drop-down list.
On the **My Credential** page, view the **Account ID**.

Figure 8-2 Viewing an account ID

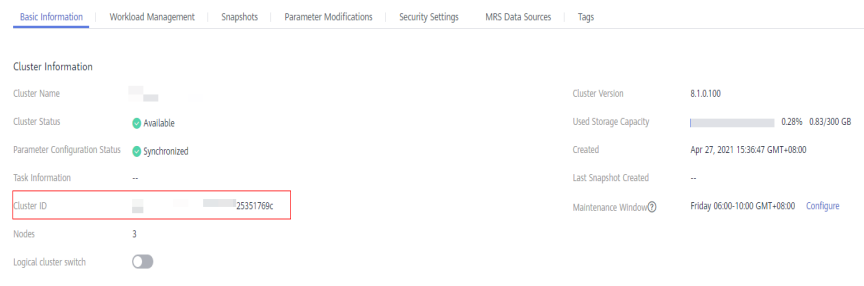


8.6 Obtaining the Cluster ID

A cluster ID (**cluster_id**) is required for some URLs when an API is called. To obtain a cluster ID, perform the following operations:

1. Log in to the GaussDB(DWS) console.
2. In the navigation pane on the left, click **Clusters**.
3. In the cluster list, find the target cluster and click the cluster name. The **Basic Information** page is displayed.
4. View the cluster ID.

Figure 8-3 Viewing the cluster ID



9 Change History

Date	Description
2022-09-15	This issue is the first official release.