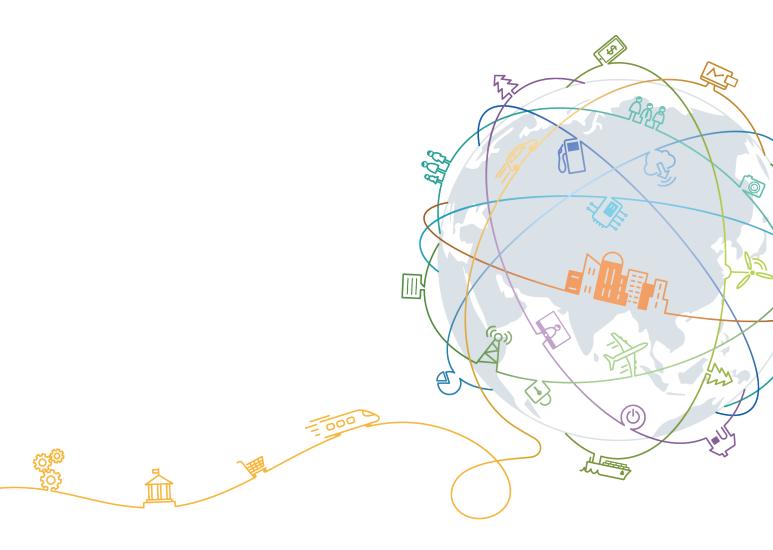
Database Security Service

User Guide

Issue 31

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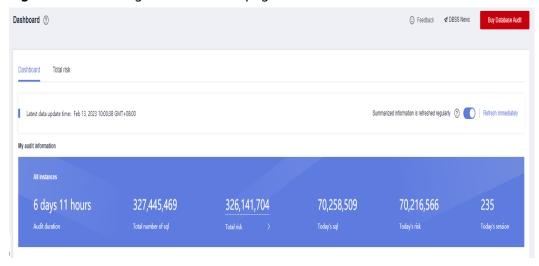
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1 Overview

On the **Dashboard** page, you can enable regular update for the audit information, view the audit information of each instance, and view the total number of SQLs, risks, and sessions of all instances.

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.

Figure 1-1 Accessing the Dashboard page



Step 3 Toggle on the **Summarized information is refreshed regularly** switch in the upper right corner.

Ⅲ NOTE

After this function is enabled, the system updates the audit information of all instances every hour based on the preset rules.

----End

My Audit Information

Displays the scanning and detection statistics of all instances.

Figure 1-2 My audit information



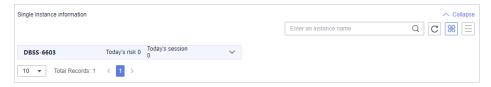
Table 1-1 Parameters

Parameter	Description
Audit duration	Total duration used for auditing all instances.
Total number of sql	Number of SQLs used for auditing all instances.
Total risk	Number of risks detected from all instances.
Today's sql	Number of SQLs used for auditing instances today.
Today's risk	Number of risks detected from the audited instances today.
Today's session	Number of sessions established for auditing instances today.

Single Instance Information

You can check the audit statistics of each instance. By default, 10 records are displayed on each page.

Figure 1-3 Single instance information



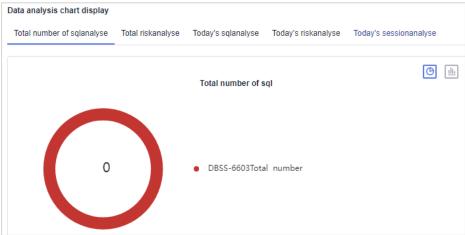
Data Analysis Chart Display

You can check the audit information about all instances by total number of SQLs, total number of risks, today's SQL, today's risks, and today's sessions.

Switch tabs to view the analysis charts as required.

Figure 1-4 Data analysis charts

Data analysis chart display



Top 5 Total Number of SQL

You can check the five instances that have used the highest number of SQLs.

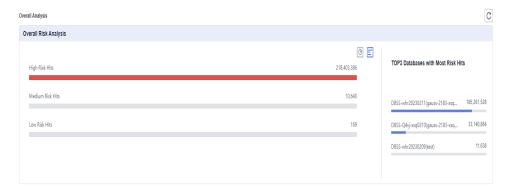
Figure 1-5 Top 5 total number of sql



Overall Risk Analysis

You can view the statistics of **High Risk Hits**, **Medium Risk Hits**, and **Low Risk Hits** among all instances. The three databases with the most risk hits are displayed in descending order in the right area.

Figure 1-6 Overall Risk Analysis



Overall Risk Rule Analysis

You can view the statistics on the number of risk rule hits. The five rules with most risk hits are displayed in descending order in the right area.

Figure 1-7 Overall Risk Rule Analysis



Risk Analysis by Level

You can view the analysis report from the following three aspects:

- Risk Level: Select High Risk Analysis, Medium Risk Analysis, or Low Risk Analysis.
- **Risk Rules**: Select a risk rule.
- Database Statistics: Select a database to view the number of risk hits.

Figure 1-8 Risk Analysis by Level



2 Enabling and Using Database Audit (by Installing Agents)

2.1 Process Overview

This section describes how to quickly enable database audit.

Background

Database audit supports auditing user-installed databases on ECS/BMS as well as RDS databases on Huawei Cloud.

NOTICE

- Database audit cannot be used across regions. The database to be audited and the database audit instance you purchased must be in the same region.
- If SSL is enabled for a database, the database cannot be audited. To use database audit, disable SSL first. For details, see How Do I Disable SSL for a Database?
- For details about audit data storage, see How Long Is the Audit Data of Database Audit Stored by Default?

Create a database audit instance, connect the instance with the target database, and enable database audit.

Auditing Databases Without Agents

Databases of some types and versions can be audited without using agents, as shown in **Table 2-1**.

Table 2-1 Agent-free relational databases

Database Type	Supported Edition	
GaussDB(for MySQL)	All editions are supported by default.	
RDS for SQLServer	All editions are supported by default.	
RDS for MySQL	5.6 (5.6.51.1 or later)5.7 (5.7.29.2 or later)8.0 (8.0.20.3 or later)	
GaussDB(DWS)	• 8.2.0.100 or later	
PostGresql	 14 (14.4 or later) 13 (13.6 or later) 12 (12.10 or later) 11 (11.15 or later) 9.6 (9.6.24 or later) 9.5 (9.5.25 or later) 	

□ NOTE

- DBSS without agents is easy to configure and use, but the following functions are not supported:
 - Successful and failed login sessions cannot be counted.
 - The port number of the client for accessing the database cannot be obtained.
- GaussDB(DWS) has the permission control policy for the log audit function. Only
 Huawei Cloud accounts and users with the Security Administrator permission can
 enable or disable the DWS database audit function.

Add a database.

Enable database audit.

View the audit results.

Figure 2-1 Agent-free auditing process

Table 2-2 Procedure for quickly configuring database audit

Step	Configuration	Description
1	Adding a Database	Purchase database audit. Add a database to the database audit instance and enable audit for the database.
		Apply for database audit. Add a database to the database audit instance and enable audit for the database.
2	Enabling Database Audit	Enable database audit and connect the added database to the database audit instance.
3	Viewing the Audit Results	By default, database audit complies with a full audit rule , which is used to audit all databases that are connected to the database audit instance. You can view the audit result on the database audit page.
		NOTICE You can set database audit rules as required. For details, see Adding Audit Scope.

Auditing Databases Using Agents

For a database whose type and version are not listed in **Table 2-1**, you need to install an agent to enable the database audit.

Add a database.

Add an agent.

Add a security group rule.

Install an agent.

Enable database audit.

View the audit results.

Figure 2-2 Procedure for quickly configuring database audit

Table 2-3 Procedure for quickly configuring database audit

Step	Configuration	Description
1	Adding a Database	Purchase database audit. Add a database to the database audit instance and enable audit for the database.
2	Adding an Agent	Select an agent add mode. Database audit supports auditing databases built on ECS, BMS, and RDS on Huawei Cloud. Select an agent add mode based on your database deployed on Huawei Cloud.
3	Adding Security Group Rules	Configure TCP (port 8000) and UDP (ports 7000 to 7100) in the security group inbound rule of the database audit instance to allow the agent to communicate with the audit instance.

Step	Configuration	Description
4	Installing an Agent (Linux OS)	Download and then install the agent on the database or application based on the add mode you chose.
5	Enabling Database Audit	Enable database audit and connect the added database to the database audit instance.
6	Viewing the Audit Results	By default, database audit complies with a full audit rule , which is used to audit all databases that are connected to the database audit instance. You can view the audit result on the database audit page.
		NOTICE You can set database audit rules as required. For details, see Adding Audit Scope.

Helpful Links

- Choose the way to add an agent and the node to install it. For details, see
 How Do I Install a Database Audit Agent?
- If the audit function is unavailable, rectify the fault by following the instructions provided in **Database Audit Is Unavailable**.

Verifying the Result

When you connect the added database to the database audit instance, database audit records all operations performed on the database. You can view the audit result on the database audit page.

2.2 Purchasing Database Audit

Before using the database audit function, you need to purchase database audit. Database audit charges yearly or monthly.

Constraints

- DBSS cannot be used across regions. The database to be audited and the database audit instance you purchased must be in the same region.
- Ensure the VPC of the database audit instance is the same as that of the node (application side or database side) where you plan to install the database audit agent. Otherwise, the instance will be unable to connect to the agent or perform audit.

For details about how to choose the node, see **How Do I Determine Where to Install an Agent?**

Impact on the System

Database audit works in out-of-path mode, which neither affects user services nor conflicts with the local audit tools.

Prerequisites

The instance account has related permissions.

NOTICE

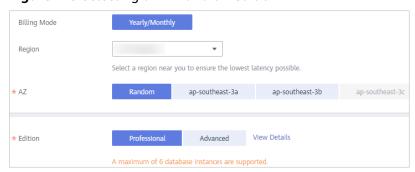
Ensure that the **DBSS System Administrator**, **VPC Administrator**, **ECS Administrator**, and **BSS Administrator** policies have been configured for the account used for purchasing instances.

- **VPC Administrator**: Users with this set of permissions can perform all execution permission for VPC. It is a project-level role, which must be assigned in the same project.
- BSS Administrator: Users with this set of permissions can perform any
 operation on menu items on pages My Account, Billing Center, and Resource
 Center. It is a project-level role, which must be assigned in the same project.
- **ECS Administrator**: Users with this set of permissions can perform any operations on an ECS. It is a project-level role, which must be assigned in the same project.

Procedure

- **Step 1** Log in to the management console.
- Step 2 Click and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- Step 3 In the upper right corner, click Buy Database Audit.
- **Step 4** Select a region, a project, an AZ, and an edition. See **Figure 2-3**.

Figure 2-3 Selecting an AZ and an edition



Select an enterprise project. The DBSS you purchase will be put under this project. Billing and permissions management are performed based on enterprise projects.

Table 2-4 describes the database audit editions.

Table 2-4 Database audit editions

Versio n	Maximum Databases	System Resource	Performance
Profess ional	6	 CPU: 8 vCPUs Memory: 32 GB Hard disk: 1000 GB 	 Peak QPS: 6,000 queries/second Database load rate: 7.2 million statements/hour Stores 600 million online SQL statements. Stores 10 billion archived SQL statements.
Advanc ed	30	 CPU: 16 vCPUs Memory: 64 GB Hard disk: 2000 GB 	 Peak QPS: 30,000 queries/ second Database load rate: 10.80 million statements/hour Stores 1.5 billion online SQL statements. Stores 60 billion archived SQL statements.

□ NOTE

- A database instance is uniquely defined by its database IP address and port.
 The number of database instances equals the number of database ports. If a database IP address has N database ports, there are N database instances.
 - Example: A user has two database IP addresses, IP_1 and IP_2 . IP_1 has a database port. IP_2 has three database ports. IP_1 and IP_2 have four database instances in total. To audit all of them, select professional edition DBSS, which supports a maximum of six database instances.
- To change the edition of a DBSS instance, unsubscribe from it and purchase a new one.
- The table above lists the system resources consumed by a database audit instance. Ensure your system has the required configurations before purchasing database audit instances.
- Online SQL statements are counted based on the assumption that the capacity of an SQL statement is 1 KB.
- **Step 5** Set database audit parameters, as shown in **Figure 2-4**. For details about related parameters, see **Table 2-5**.

Figure 2-4 Setting database audit parameters



Table 2-5 Database audit parameters

Parameter	Description
VPC	You can select an existing VPC, or click View VPC to create one on the VPC console.
	NOTE
	 Select the VPC of the node (application or database side) where you plan to install the agent. For more information, see How Do I Determine Where to Install an Agent?
	To change the VPC of a DBSS instance, unsubscribe from it and purchase a new one.
	For more information about VPC, see <i>Virtual Private Cloud User Guide</i> .
Security Group	You can select an existing security group in the region or create a security group on the VPC console. Once a security group is selected for an instance, the instance is protected by the access rules of this security group.
	For more information about security groups, see <i>Virtual Private Cloud User Guide</i> .
Subnet	You can select a subnet configured in the VPC or create a subnet on the VPC console.
Name	Instance name

Step 6 Set Required Duration. See Figure 2-5.

Figure 2-5 Setting the required duration



After you select **Auto-renew**, the system automatically renews the instance upon expiry if your account balance is sufficient. You can continue to use the instance. **Table 2-6** describes the auto-renewal period.

Table 2-6 Auto-renewal period description

Required Duration	Auto-renewal Period	
1/2/3/4/5/6/7/8/9 months	1 month	
1 year	1 year	

- **Step 7** (Optional) Add tags to the database audit instance. If you have configured tag policies for DBSS, you need to add tags to your DBSS instances based on the tag policies. If a tag does not comply with the policies, DBSS instance may fail to be created. Contact your organization administrator to learn more about tag policies.
- Step 8 Confirm the configuration and click Next.For any doubt about the pricing, click Pricing details to understand more.
- Step 9 On the Details page, read the *Database Audit of Database Security Service*Disclaimer, select I have read and agree to the Database Audit of Database

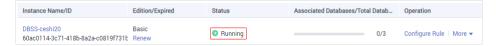
 Security Service Disclaimer, and click Submit.
- **Step 10** On the displayed page, select a payment method.
- **Step 11** After you pay for your order, you can view the creation status of your instances.

----End

Follow-Up Procedure

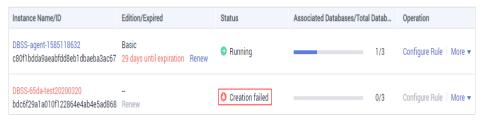
• If the **Status** of the instance is **Running**, as shown in **Figure 2-6**, you have successfully purchased the database audit instance.

Figure 2-6 Successfully purchasing database audit



• If the instance status is **Creation failed**, as shown in **Figure 2-7**, you will be automatically refunded. You can click **More** in the **Operation** column and view details in the **Failure Details** dialog box.

Figure 2-7 Database audit instance creation failed



2.3 Step 1: Add a Database

Database audit supports databases built on ECS, BMS, and RDS on Huawei Cloud. After purchasing a database audit instance, you need to add the database to be audited to the instance.

For details about the types and versions of databases that can be audited by database audit, see **Supported Database Types and Versions**.

Prerequisites

You have purchased a database audit instance and the **Status** is **Running**.

Adding a Database

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Databases**.
- **Step 4** In the **Instance** drop-down list, select the instance whose database is to be added.
- Step 5 Click Add Database.
- **Step 6** In the dialog box displayed, set the database information, as shown in Figure 2-8.

Figure 2-8 Add Database dialog box

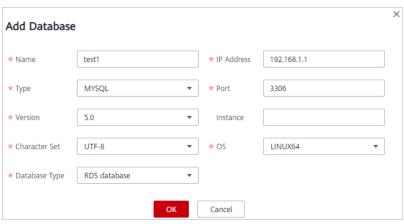


Table 2-7 Parameters

Parameter	Description	Example Value
Name	Custom name of the database to be added	test1

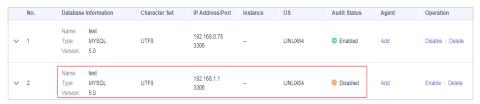
Parameter	Description	Example Value
IP Address	IP address of the database to be added. The IP address must be an internal IP address in IPv4 or IPv6 format.	IPv4: 192.168.1.1 IPv6: fe80:0000:0 000:0000:00 0:0000:000
Туре	Supported database type. The options are as follows: MYSQL ORACLE POSTGRESQL SQLSERVER DWS GaussDB(for MYSQL) GaussDB DAMENG KINGBASE MongoDB Hbase SHENTONG GBase 8a GBase XDM Cluster Greenplum HighGo Mariadb NOTE If ORACLE is selected, to make the audit settings take effect, restart the applications to be audited and log in to the database again.	MYSQL
Port	Port number of the database to be added	3306

Parameter	Description	Example Value
Version	Supported database versions	5.0
	When Type is set to MYSQL , the following versions are available:	
	 If RDS database is selected, a list of database instances will be displayed for you to choose from. You do not need to install the agent. 	
	When Type is set to ORACLE , the following versions are available:	
	– 11g	
	- 12c	
	– 19c	
	When Type is set to POSTGRESQL , the following versions are available:	
	- 7.4	
	- 8.0 8.0, 8.1, 8.2, 8.3, 8.4	
	- 9.0 9.0, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6	
	- 10.0 10.0, 10.1, 10.2, 10.3, 10.4, 10.5	
	- 11.0	
	- 12.0	
	- 13.0	
	When Type is set to SQLSERVER , the following versions are available:	
	- 2008	
	- 2012	
	- 2014	
	– 2016	
	- 2017	
	 When Type is set to DWS, the following versions are available: 	
	- 1.5	
	- 8.1	
	 When Type is set to GaussDB(for MySQL), the following versions are available: 	
	 When Database Type is set to Self-built database, you can select the MySQL 8.0 version. 	

Parameter	Description	Example Value
	 If RDS database is selected, a list of database instances will be displayed for you to choose from. You do not need to install the agent. 	
	• When Type is set to GaussDB , the following version is available:	
	– 1.4 Enterprise Edition	
	When Type is set to DAMENG , the following version is available:	
	- DM8	
	When Type is set to KINGBASE , the following version is available:	
	- V8	
	When Type is set to Hbase , the following versions are available:	
	- 1.3.1	
	- 2.2.3	
Instance	Instance name of the database to be audited NOTE If you do not configure the Instance field,	-
	database audit will audit all instances in the database.	
	If you enter an instance name, database audit will audit the entered instance. Enter a maximum of five instance names and use semicolons (;) to separate instance names.	
Character Set	Encoding format of the database character set. The options are as follows:	UTF-8
	UTF-8 GBK	
OS	OS of the added database. The options are as follows: • LINUX64	LINUX64
	WINDOWS64	
Database Type	Type of the database to be added. Its value can be RDS database or Self-built database.	RDS database

Step 7 Click **OK**. Then a database in the **Disabled** state has been added to the database list. See **Figure 2-9**.

Figure 2-9 Successfully adding a database



◯ NOTE

After adding the database, confirm that the database information is correct. If the
database information is incorrect, locate the target database and click **Delete** in the
Operation column, and add the database again.

----End

2.4 Step 2: Add an Agent

Add a new agent or choose an existing agent for the database to be audited, depending on your database type. The agent will obtain database access traffic, upload traffic statistics to the audit system, receive audit system configuration commands, and report database monitoring data.

After adding an agent, configure TCP (port 8000) and UDP (ports 7000 to 7100) in the security group inbound rule of the agent node to allow the agent to communicate with the audit instance.

Ⅲ NOTE

Currently, only the following types of databases support agent-free audit:

- GaussDB for MySQL
- RDS for SQLServer
- RDS for MySQL
 - 5.6 (5.6.51.1 or later)
 - 5.7 (5.7.29.2 or later)
 - 8.0 (8.0.20.3 or later)
- GaussDB(DWS): 8.2.0.100 or later

Prerequisites

- You have purchased a database audit instance and the **Status** is **Running**.
- A database has been added.

Scenarios

Determine where to add the agent based on how your database is deployed. Common database deployment modes are as follows:

Deploy DBSS for databases built on ECS/BMS. For details, see Figure 2-10 and Figure 2-11.

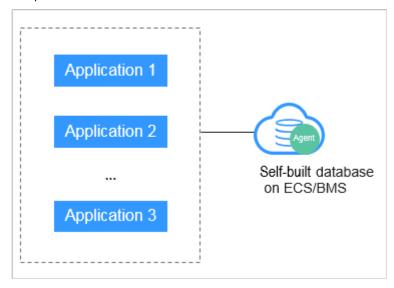
Self-built databases on ECS/BMS

Application

...

Figure 2-10 One application connecting to multiple databases built on ECS/BMS

Figure 2-11 Multiple applications connecting to one database built on ECS/BMS



• Deploy DBSS for RDS databases. For details, see Figure 2-12 and Figure 2-13.

Figure 2-12 One application connecting to multiple RDS databases

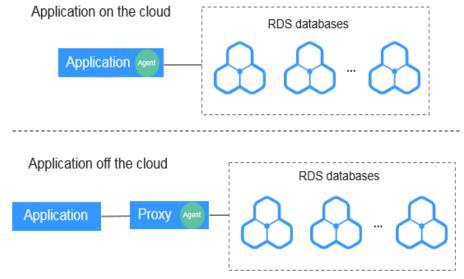


Figure 2-13 Multiple applications connecting to one RDS database

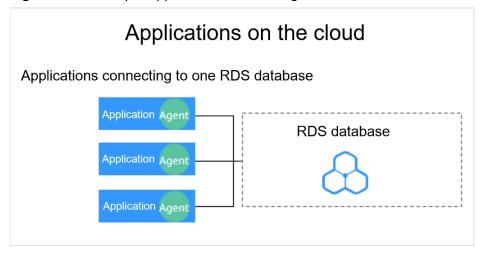


Table 2-8 provides more details.

NOTICE

 If your applications and databases (databases built on ECS/BMS) are deployed on the same node, add the agent on the database side.

Table 2-8 Agent locations

Scenario	Where to Add the Agent	Audit Scope	Description
Databases built on ECS/BMS	Database	All access records of applications that have accessed the database	 Add the agent on the database side. If an application connects to multiple databases built on ECS/BMS, the agent must be added on all these databases.
RDS database	Application (if applications are deployed on the cloud)	Access records of all the databases connected to the application	 Add the agent on the application side. If an application connects to multiple RDS databases, add an agent on each of the databases. Set Installation Node Type for one of them and select Select an existing agent for the rest of them. For details, see Selecting an existing agent. If multiple applications connect to the same RDS database, add the agent must on all these applications.
	Proxy side (if applicatio ns are deployed off the cloud)	Only the access records between the proxy and database. Those between the applications and database cannot be audited.	 Add the agent on the application side. Installing Node IP Address must be set to the IP address of the proxy.

Adding an Agent (Self-built Databases on ECS/BMS)

- **Step 1** Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Databases**.
- **Step 4** In the **Instance** drop-down list, select the instance whose agent is to be added.

- **Step 5** In the **Agent** column of the desired database, click **Add**.
- **Step 6** In the dialog box displayed, select an add mode, as shown in **Figure 2-14**. For details about related parameters, see **Table 2-9**.

Figure 2-14 Adding an agent to a database

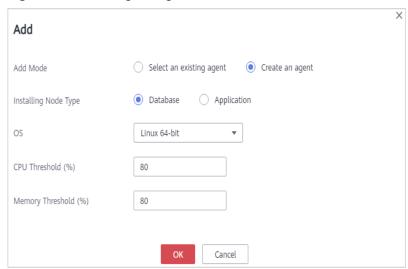


Table 2-9 Parameters for adding an agent (databases built on ECS/BMS)

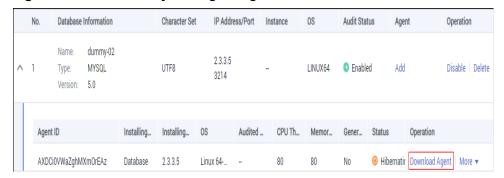
Parameter	Description	Example Value
Add Mode	 Select an existing agent If an agent has been installed on a database connected to the same application as the desired database, select Select an existing agent. 	Create an agent
	Create an agent If no agent is available, select Create an agent to create one.	
Installing Node Type	This parameter is mandatory when Add Mode is set to Create an agent .	Database
	When auditing user-installed databases on ECS/BMS, select Database for Installing Node Type .	
OS	OS of the database to be audited. Its value can be .	LINUX64- X86
	You can select LINUX64-X86 , LINUX64-ARM , or WINDOWS64 .	
	NOTE Select LINUX64_X86 or LINUX64_ARM based on the server architecture.	

Parameter	Description	Example Value
CPU Threshold (%)	Optional. This parameter is configurable if Installing Node Type is set to Application .	80
	CPU threshold of the application node to be audited. The default value is 80 .	
Memory Threshold (%)	Optional. This parameter is configurable if Installing Node Type is set to Application .	80
	Memory threshold of the application node to be audited. The default value is 80 .	

Step 7 Click OK.

Step 8 Click in the lower part of the database list page to expand the database details and view the information about the added agent.

Figure 2-15 Successfully adding an agent



◯ NOTE

After adding the agent, confirm that the agent information is correct. If the agent is incorrectly added, locate the target agent, click **More** > **Delete** in the **Operation** column, and add an agent again.

----End

Adding an Agent (RDS Databases)

■ NOTE

After you add a MySQL or GaussDB(for MySQL) database, you can start configuring security group rules. You do not need to install an agent on the database.

If an application connects to multiple RDS databases, be sure to:

- Add an agent to each of the RDS databases.
- Select **Select an existing agent** if one of the databases already has an agent. Add that agent for the rest of the databases.

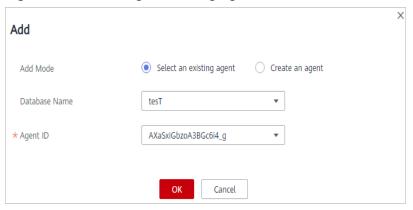
Step 1 Log in to the management console.

- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Databases**.
- **Step 4** In the **Instance** drop-down list, select the instance whose agent is to be added.
- **Step 5** In the **Agent** column of the desired database, click **Add**.
- **Step 6** In the displayed dialog box, select an add mode, as shown in **Figure 2-16** and **Figure 2-17**. For details about related parameters, see **Table 2-10**.
 - Select Select an existing agent for Add Mode.

For details about when you should select this option, see **When Should I Select an Existing Agent?**

If an agent has been installed on the application, you can select it to audit the desired database.

Figure 2-16 Selecting an existing agent



• Set Add Mode to Create an agent.

If no agent is available, select **Create an agent** to create one.

Select **Installing Node Type** to **Application**, and set **Installing Node IP Address** to the intranet IP address of the application.

Add

Add Mode

Select an existing agent

Create an agent

Installing Node Type

Database

Application

* Installing Node IP Address

192.168.1.1

Audited NIC Name

CPU Threshold (%)

80

Memory Threshold (%)

OS

Linux 64-bit

OK

Cancel

Figure 2-17 Adding an agent to an application

Table 2-10 Parameters for adding an agent (RDS databases)

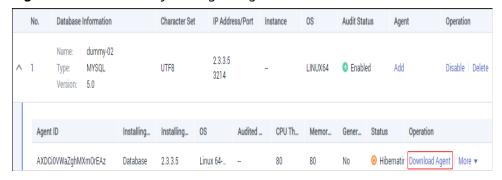
Parameter	Description	Example Value
Add Mode	 Selecting an existing agent If an agent has been installed on a database connected to the same application as the desired database, select Select an existing agent. Create an agent If no agent is available, select Create an agent to create one. 	Create an agent
Installing Node Type	This parameter is mandatory when Add Mode is set to Create an agent . To audit the RDS databases, select Application .	Application
Installing Node IP Address	This parameter is mandatory if Installing Node Type is set to Application . You can enter only one installation node IP address. The IP address of an agent must be unique. The IP address is the intranet IP address of the application.	192.168.1.1
	The IP address must be an internal IP address in IPv4 or IPv6 format.	
	NOTICE To audit an RDS database connected to an off-cloud application, set this parameter to the IP address of the proxy.	

Parameter	Description	Example Value
Audited NIC Name	Optional. This parameter is configurable if Installing Node Type is set to Application .	-
	Name of the network interface card (NIC) of the application node to be audited	
CPU Threshold (%)	Optional. This parameter is configurable if Installing Node Type is set to Application .	80
	CPU threshold of the application node to be audited. The default value is 80 .	
	NOTICE If the CPU usage of a server exceeds the threshold, the agent on the server will stop running.	
Memory Threshold (%)	Optional. This parameter is configurable if Installing Node Type is set to Application .	80
	Memory threshold of the application node to be audited. The default value is 80 .	
	NOTICE If the memory usage of your server exceeds the threshold, the agent will stop running.	
OS	Optional. This parameter is configurable if Installing Node Type is set to Application .	LINUX64
	OS of the application node to be audited. The value can be LINUX64 or WINDOWS64 .	

Step 7 Click OK.

Step 8 Click next to the database to view its details and information about the added agent.

Figure 2-18 Successfully adding an agent



■ NOTE

After adding the agent, confirm that the agent information is correct. If the agent is incorrectly added, locate the target agent, click **More** > **Delete** in the **Operation** column, and add an agent again.

----End

Follow-Up Procedure

Configure TCP (port 8000) and UDP (ports 7000 to 7100) in the security group inbound rule of the agent node to allow the agent to communicate with the audit instance. For details about how to add a security group rule, see **Adding a Security Group Rule**.

2.5 Step 3: Download and Install the Agent

2.5.1 Downloading an Agent

Download and then install the agent on the database or application based on the add mode you chose.

□ NOTE

Each agent has a unique ID, which is used as the key for connecting to a database audit instance. If you delete an agent and add it back, you need to download the agent again.

Prerequisites

- You have purchased a database audit instance and the **Status** is **Running**.
- You have added an agent to the database.

Procedure

- **Step 1** Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Databases**.
- **Step 4** In the **Instance** drop-down list, select the instance whose agent is to be downloaded.
- **Step 5** Click in the lower part of the database list to expand the agent details. Locate the target agent and click **Download Agent** in the **Operation** column. to download an agent installation package.

Figure 2-19 Downloading an agent



Download the agent installation package suitable for your OS.

- Linux OS
 Download the agent whose OS is LINUX64.
- Windows OS
 Download the agent whose OS is WINDOWS64.

----End

2.5.2 Installing an Agent (Linux OS)

You can enable database audit only after the agent is installed. This topic describes how to install the agent on a node running a Linux OS. For details about how to install an agent on the Windows OS, see **Installing an Agent (Windows OS)**.

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- You have added an agent to your database.
- You have obtained the agent installation package for the Linux OS.
- The Linux OS version of the target node is supported by the agent. For details about the supported Linux versions, see On What Linux OSs Can I Install the Agent?

Scenarios

You can install the agent on the database or application side, depending on your database type and deployment scenario. Common database scenarios are as follows:

Deploy DBSS for databases built on ECS/BMS. For details, see Figure 2-20 and Figure 2-21.

Figure 2-20 One application connecting to multiple databases built on ECS/BMS

Self-built databases on ECS/BMS

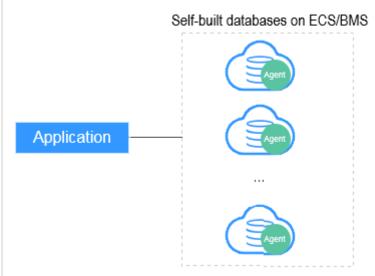
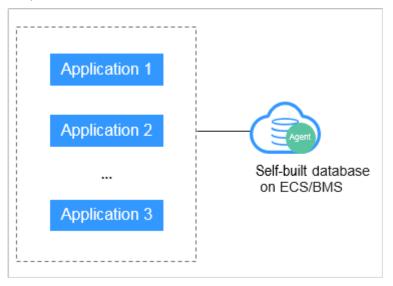


Figure 2-21 Multiple applications connecting to one database built on ECS/BMS



• Deploy DBSS for RDS databases. For details, see Figure 2-22 and Figure 2-23.

Figure 2-22 One application connecting to multiple RDS databases

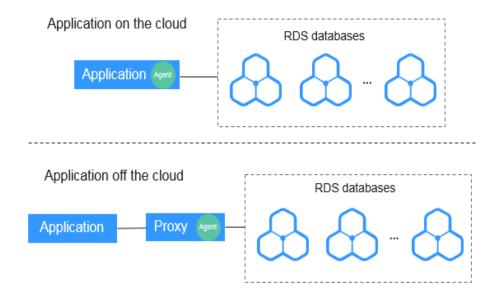


Figure 2-23 Multiple applications connecting to one RDS database

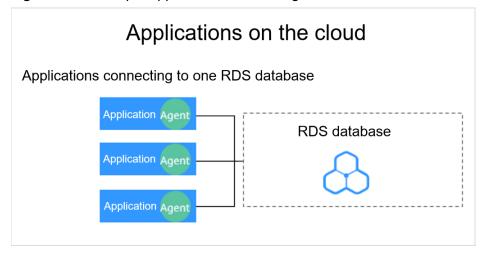


Table 2-11 describes where to install the agent in the preceding scenarios.

NOTICE

If your applications and databases (databases built on ECS/BMS) are deployed on the same node, install the agent on the database side.

Scenario Where to Audit Scope Description Install Agent Self-built All access records of • Install the agent on the Database database applications that database side. have accessed the on • If an application connects ECS/BMS database to multiple databases built on ECS/BMS, the agent must be installed on all these databases. RDS Applicatio Access records of all • Install the agent on the database n side (if the databases application side. applicatio connected to the • If multiple applications ns are application are connected to the deployed same RDS database, the on the agent must be installed cloud) on all these applications. **RDS** Proxy side Only the access Install the agent on the database records between the proxy side. (if applicatio proxy and database. ns are Those between the deployed applications and off the database cannot be

Table 2-11 Agent installation scenarios

Installing an Agent

Install the agent on the node suitable for your service scenario.

audited.

- **Step 1** Upload the downloaded agent installation package **xxx.tar.gz** to the node (for example, using WinSCP).
- **Step 2** Log in to the node as user **root** using SSH through a cross-platform remote access tool (for example, PuTTY).
- **Step 3** Run the following command to access the directory where the agent installation package **xxx.tar.gz** is stored:
 - cd Directory_containing_agent_installation_package
- **Step 4** Run the following command to decompress the installation package **xxx.tar.gz**: **tar -xvf** *xxx.tar.gz*
- **Step 5** Run the following command to switch to the directory containing the decompressed files:
 - **cd** Decompressed package directory

cloud)

Step 6 Run the following command to check whether you have the permission for executing the **install.sh** script:

ll

- If you do, go to Step 7.
- If you do not, perform the following operations:
 - a. Run the following command to get the script execution permission:

chmod +x install.sh

b. Verify you have the required permissions.

Step 7 Run the following command to install the agent:

sh install.sh

In Ubantu, run the following command to install the agent:

bash install.sh

If the following information is displayed, the agent has been installed. Otherwise, the installation fails.

start agent starting audit agent audit agent started start success install dbss audit agent done!

NOTICE

If the agent installation failed, ensure the OS version of the target node is supported and try again.

Step 8 Run the following command to view the running status of the agent program:

service audit_agent status

If the following information is displayed, the agent is running properly: audit agent is running.

----End

Helpful Links

- For details about how to add an agent, see Step 2: Add an Agent.
- For details about how to uninstall an agent, see Uninstalling an Agent.

2.5.3 Installing an Agent (Windows OS)

You can enable database audit only after the agent is installed. This topic describes how to install the agent on a node running a Windows OS. For details about how to install an agent on the Linux OS, see **Installing an Agent (Linux OS)**.

Prerequisites

You have added an agent to your database.

- You have obtained the agent installation package for the Windows OS.
- The Windows OS version of the target node is supported by the agent. For details about the supported Windows versions, see On What Windows OSs Can I Install the Agent?

Scenarios

You can install the agent on the database or application side, depending on your database type and deployment scenario. Common database scenarios are as follows:

Deploy DBSS for databases built on ECS/BMS. For details, see Figure 2-24 and Figure 2-25.

Figure 2-24 One application connecting to multiple databases built on ECS/BMS

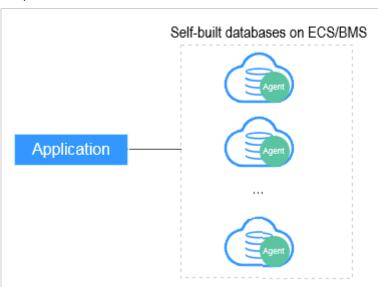
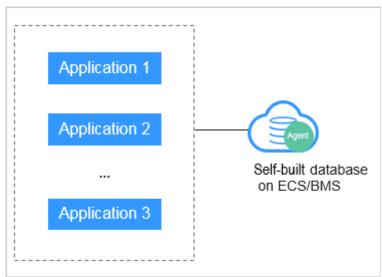


Figure 2-25 Multiple applications connecting to one database built on ECS/BMS



Deploy DBSS for RDS databases. For details, see Figure 2-26 and Figure 2-27.

Figure 2-26 One application connecting to multiple RDS databases

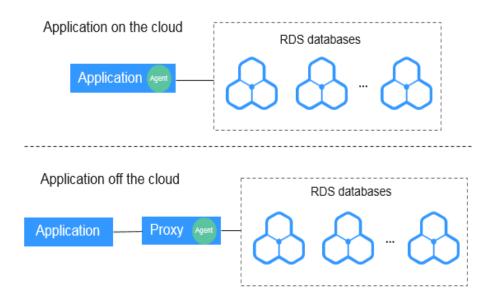


Figure 2-27 Multiple applications connecting to one RDS database

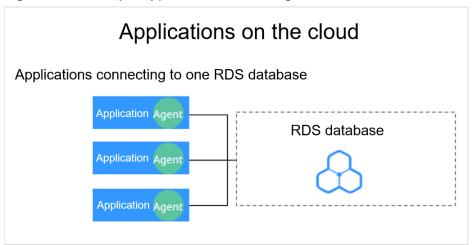


Table 2-12 describes where to install the agent in the preceding scenarios.

NOTICE

If your applications and databases (databases built on ECS/BMS) are deployed on the same node, install the agent on the database side.

Scenario Where to **Audit Scope** Description Install Agent Self-built Install the agent on the Database All access records of database applications that database side. have accessed the on If an application connects ECS/BMS database to multiple databases built on ECS/BMS, the agent must be installed on all these databases. RDS Applicatio Access records of all Install the agent on the database n side (if the databases application side. applicatio connected to the • If multiple applications ns are application are connected to the deployed same RDS database, the on the agent must be installed cloud) on all these applications. **RDS** Proxy side Only the access Install the agent on the database records between the proxy side. (if applicatio proxy and database. ns are Those between the deployed applications and off the database cannot be cloud) audited.

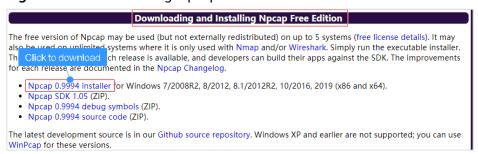
Table 2-12 Agent installation scenarios

Installing an Agent

Step 1 Install Npcap on the Windows server.

- If Npcap has been installed on the Windows OS, go to Step 2.
- If the Npcap has not been installed on the Windows server, perform the following steps:
 - Download the latest Npcap software installation package from https:// nmap.org/npcap/.

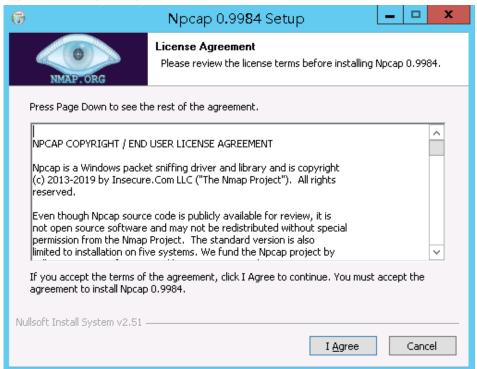
Figure 2-28 Downloading Npcap



b. Upload the **npcap-**xxxx.**exe** software installation package to the VM where the agent is to be installed.

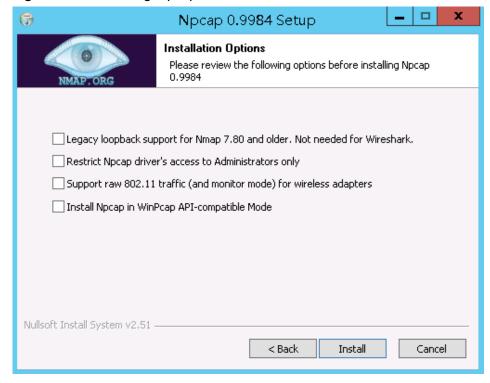
- c. Double-click the Npcap installation package.
- d. In the displayed dialog box, click I Agree, as shown in Figure 2-29.

Figure 2-29 Agreeing to install Npcap

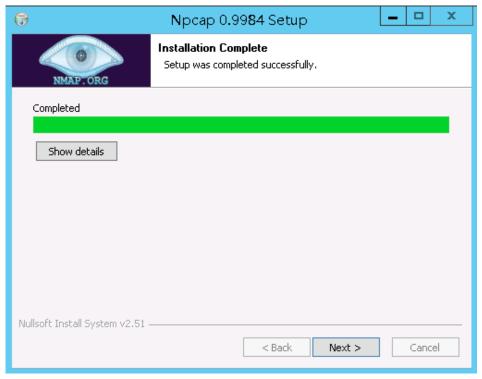


e. In the displayed dialog box, leave all the check boxes unselected and click **Install**, as shown in **Figure 2-30**.

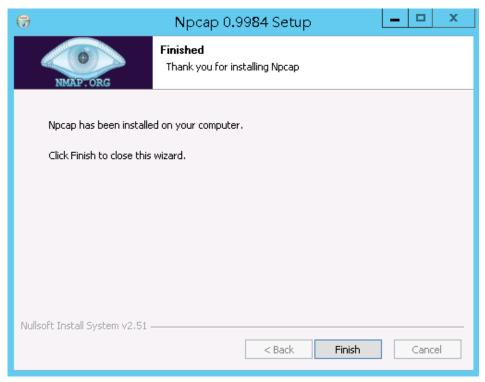
Figure 2-30 Installing Npcap



f. In the displayed dialog box, click **Next**.



g. Click Finish.



- **Step 2** Log in to the target Windows server as the **Administrator** user.
- **Step 3** Copy the downloaded .zip agent installation package to any directory on the server.

- **Step 4** Decompress the package.
- **Step 5** Double-click the **install.bat** file in the package directory.
- **Step 6** Press any key to complete installation after the output shown in **Figure 2-31** is displayed.

Figure 2-31 Installation completed

```
<del>(***********************</del>
    DBSS Servcie Audit Agent Install
  <del>*********************</del>
install DBSS audit agent start...
heck npcap existed success:
heck main process file success
check child process file success
check dll file success
check dll file success
check startup file success
              1
              1
              1
check dbss agent config file success
check log folder success
install DBSS audit agent success
start DBSS audit agent success
```

Step 7 Check the installation result. If the dbss_audit_agent process can be found in the Windows Task Manager, the installation succeeded.

If it is not found, install the agent again.

----End

2.6 Step 4: Add a Security Group Rule

Configure TCP (port 8000) and UDP (ports 7000 to 7100) in the security group inbound rule of the database audit instance to allow the agent to communicate with the audit instance.

This section describes how to configure TCP (port 8000) and UDP (ports 7000 to 7100) for a security group.

You can configure security group rules before or after installing an agent.

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- You have added an agent to your database.

Adding a Security Group Rule

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Database Audit** > **Databases**.
- **Step 4** In the **Instance** drop-down list, select the instance whose security group rule is to be added.
- **Step 5** Record the IP address of the agent node.

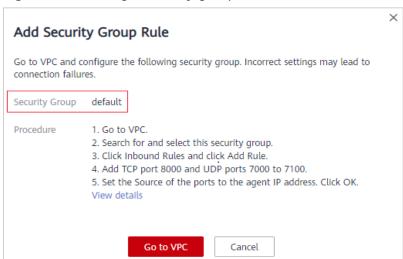
Click with next to the database to view the information of its agent, and record **Installing Node IP Address**, as shown in **Figure 2-32**.

Figure 2-32 Installing Node IP Address



- **Step 6** Click **Add Security Group Rule**.
- **Step 7** In the displayed dialog box, record the security group name (for example, **default**) of the database audit instance, as shown in **Figure 2-33**.

Figure 2-33 Adding a security group rule



- Step 8 Click Go to VPC.
- **Step 9** In the security group list, enter the group name **default** in the search box in the upper right corner of the list, and click or press **Enter**. The group information is displayed in the list.
- **Step 10** Click the group name **default**.
- Step 11 Click the Inbound Rules tab.

Check whether TCP (port number **8000**) and UDP protocols (port number from **7000** to **7100**) are configured in the inbound rules of the security group for the IP address of the installing node in **Step 5**.

- If the inbound rules of the security group have been configured for the installing node, go to **Downloading an Agent**.
- If no inbound rules of the security group have been configured for the installing node, go to **Step 12**.

Step 12 Add an inbound rule for the installing node.

1. On the **Inbound Rules** tab, click **Add Rule**.

Figure 2-34 Adding rules



2. In the **Add Inbound Rule** dialog box, add **TCP** (port number **8000**) and **UDP** protocols (port number from **7000** to **7100**) for the installing node IP address in **Figure 2-32**. See **Figure 2-35**.

□ NOTE

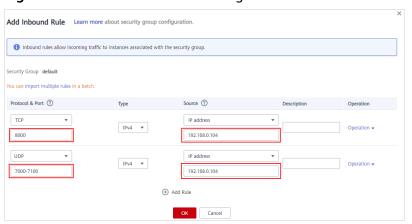
The source can be an IP address, an IP address segment, or a security group. Examples:

- IP address: 192.168.10.10/32

- IP address segment: 192.168.52.0/24

All IP addresses: 0.0.0.0/0Security group: sg-abc

Figure 2-35 Add Inbound Rule dialog box



3. Click OK.

After adding a security group rule, download and install the agent on a database or application, depending on the add mode you chose. Database audit can be enabled only if the audited object is connected to the database audit instance.

2.7 Step 5: Enable Database Audit

By default, database audit complies with a **full audit rule**, which is used to audit all databases that are connected to the database audit instance. You can enable audit and check audit results. For details, see **Viewing the Audit Dashboard**.

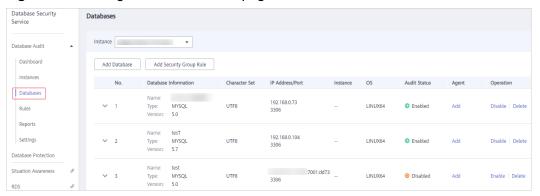
Prerequisites

- You have added and installed an agent, and the agent status is Running.
- A security group rule has been configured for the database audit instance.

Enabling Database Audit

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Databases**.

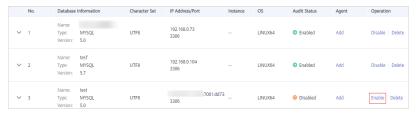
Figure 2-36 Going to the Databases page



- **Step 4** Select a database audit instance from the **Instance** drop-down list.
- **Step 5** In the database list, click **Enable** in the **Operation** column of the database you want to audit.

The **Audit Status** of the database is **Enabled**. You do not need to restart the database.

Figure 2-37 Enabling database audit



Verifying Audit Results

- **Step 1** Run an SQL statement (for example, **show databases**) in the target database.
- Step 2 Log in to the management console.
- Step 3 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 4** In the navigation tree on the left, choose **Data Reports**. The **Data Reports** page is displayed.
- **Step 5** In the **Instance** drop-down list, select the instance that audits the target database.
- **Step 6** Click the **Statements** tab.
- Step 7 Click next to **Time** to set the start and end time, and click **Submit**. The SQL statements entered in **Step 1** will be displayed.

Figure 2-38 Viewing SQL statements



• If the entered SQL statement is not displayed, the connection between the agent and the database audit instance is abnormal. Rectify the fault by following the instructions in What Do I Do If the Communication Between the Agent and Database Audit Instance Is Abnormal?

Enabling and Using Database Audit (Without Installing Agents)

3.1 Process Overview

Background

Database audit supports auditing user-installed databases on ECS/BMS as well as RDS databases on Huawei Cloud.

NOTICE

- Database audit cannot be used across regions. The database to be audited and the database audit instance you purchased must be in the same region.
- If SSL is enabled for a database, the database cannot be audited. To use database audit, disable SSL first. For details, see How Do I Disable SSL for a Database?
- For details about audit data storage, see How Long Is the Audit Data of Database Audit Stored by Default?

Auditing Databases Without Agents

Databases of some types and versions can be audited without using agents, as shown in **Table 3-1**.

Table 3-1 Agent-free relational databases

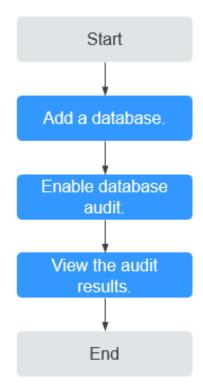
Database Type	Supported Edition	
GaussDB(for MySQL)	All editions are supported by default.	
RDS for SQLServer	All editions are supported by default.	

Database Type	Supported Edition
RDS for MySQL	• 5.6 (5.6.51.1 or later)
	• 5.7 (5.7.29.2 or later)
	• 8.0 (8.0.20.3 or later)
GaussDB(DWS)	• 8.2.0.100 or later
PostGresql	• 14 (14.4 or later)
	• 13 (13.6 or later)
	• 12 (12.10 or later)
	• 11 (11.15 or later)
	• 9.6 (9.6.24 or later)
	• 9.5 (9.5.25 or later)

MOTE

- DBSS without agents is easy to configure and use, but the following functions are not supported:
 - Successful and failed login sessions cannot be counted.
 - The port number of the client for accessing the database cannot be obtained.
- GaussDB(DWS) has the permission control policy for the log audit function. Only Huawei Cloud accounts and users with the **Security Administrator** permission can enable or disable the DWS database audit function.

Figure 3-1 Agent-free auditing process



Configuration Description Step 1 Adding a Database Purchase database audit. Add a database to the database audit instance and enable audit for the database. Apply for database audit. Add a database to the database audit instance and enable audit for the database. 2 **Enabling Database** Enable database audit and connect the added database to the database audit instance. Audit 3 **Viewing the Audit** By default, database audit complies with a full audit rule, which is used to audit all **Results** databases that are connected to the database audit instance. You can view the audit result on the database audit page. NOTICE You can set database audit rules as required. For

details, see Adding Audit Scope.

Table 3-2 Procedure for quickly configuring database audit

3.2 Purchasing Database Audit

Before using the database audit function, you need to purchase database audit. Database audit charges yearly or monthly.

Constraints

- DBSS cannot be used across regions. The database to be audited and the database audit instance you purchased must be in the same region.
- Ensure the VPC of the database audit instance is the same as that of the node (application side or database side) where you plan to install the database audit agent. Otherwise, the instance will be unable to connect to the agent or perform audit.

For details about how to choose the node, see **How Do I Determine Where to Install an Agent?**

Impact on the System

Database audit works in out-of-path mode, which neither affects user services nor conflicts with the local audit tools.

Prerequisites

The instance account has related permissions.

NOTICE

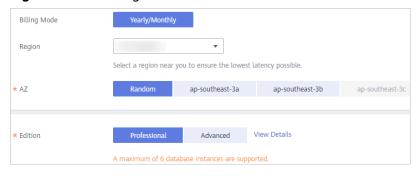
Ensure that the **DBSS System Administrator**, **VPC Administrator**, **ECS Administrator**, and **BSS Administrator** policies have been configured for the account used for purchasing instances.

- **VPC Administrator**: Users with this set of permissions can perform all execution permission for VPC. It is a project-level role, which must be assigned in the same project.
- BSS Administrator: Users with this set of permissions can perform any operation on menu items on pages My Account, Billing Center, and Resource Center. It is a project-level role, which must be assigned in the same project.
- **ECS Administrator**: Users with this set of permissions can perform any operations on an ECS. It is a project-level role, which must be assigned in the same project.

Procedure

- **Step 1** Log in to the management console.
- Step 2 Click and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the upper right corner, click **Buy Database Audit**.
- **Step 4** Select a region, a project, an AZ, and an edition. See **Figure 3-2**.

Figure 3-2 Selecting an AZ and an edition



Select an enterprise project. The DBSS you purchase will be put under this project. Billing and permissions management are performed based on enterprise projects.

Table 3-3 describes the database audit editions.

Table 3-3 Database audit editions

Versio n	Maximum Databases	System Resource	Performance
Profess ional	6	 CPU: 8 vCPUs Memory: 32 GB Hard disk: 1000 GB 	 Peak QPS: 6,000 queries/second Database load rate: 7.2 million statements/hour Stores 600 million online SQL statements. Stores 10 billion archived SQL statements.
Advanc ed	30	 CPU: 16 vCPUs Memory: 64 GB Hard disk: 2000 GB 	 Peak QPS: 30,000 queries/ second Database load rate: 10.80 million statements/hour Stores 1.5 billion online SQL statements. Stores 60 billion archived SQL statements.

□ NOTE

- A database instance is uniquely defined by its database IP address and port.
 The number of database instances equals the number of database ports. If a database IP address has N database ports, there are N database instances.
 - Example: A user has two database IP addresses, IP_1 and IP_2 . IP_1 has a database port. IP_2 has three database ports. IP_1 and IP_2 have four database instances in total. To audit all of them, select professional edition DBSS, which supports a maximum of six database instances.
- To change the edition of a DBSS instance, unsubscribe from it and purchase a new one.
- The table above lists the system resources consumed by a database audit instance. Ensure your system has the required configurations before purchasing database audit instances.
- Online SQL statements are counted based on the assumption that the capacity of an SQL statement is 1 KB.
- **Step 5** Set database audit parameters, as shown in **Figure 3-3**. For details about related parameters, see **Table 3-4**.

Figure 3-3 Setting database audit parameters



Table 3-4 Database audit parameters

Parameter	Description	
VPC	You can select an existing VPC, or click View VPC to create one on the VPC console.	
	NOTE	
	 Select the VPC of the node (application or database side) where you plan to install the agent. For more information, see How Do I Determine Where to Install an Agent? 	
	To change the VPC of a DBSS instance, unsubscribe from it and purchase a new one.	
	For more information about VPC, see <i>Virtual Private Cloud User Guide</i> .	
Security Group	You can select an existing security group in the region or create a security group on the VPC console. Once a security group is selected for an instance, the instance is protected by the access rules of this security group.	
	For more information about security groups, see <i>Virtual Private Cloud User Guide</i> .	
Subnet	You can select a subnet configured in the VPC or create a subnet on the VPC console.	
Name	Instance name	

Step 6 Set Required Duration. See Figure 3-4.

Figure 3-4 Setting the required duration



After you select **Auto-renew**, the system automatically renews the instance upon expiry if your account balance is sufficient. You can continue to use the instance. **Table 3-5** describes the auto-renewal period.

Table 3-5 Auto-renewal period description

Required Duration	Auto-renewal Period
1/2/3/4/5/6/7/8/9 months	1 month
1 year	1 year

- **Step 7** (Optional) Add tags to the database audit instance. If you have configured tag policies for DBSS, you need to add tags to your DBSS instances based on the tag policies. If a tag does not comply with the policies, DBSS instance may fail to be created. Contact your organization administrator to learn more about tag policies.
- Step 8 Confirm the configuration and click Next.For any doubt about the pricing, click Pricing details to understand more.

Security Service Disclaimer, and click **Submit**.

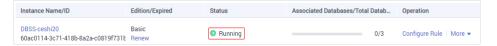
- Step 9 On the Details page, read the *Database Audit of Database Security Service Disclaimer*, select I have read and agree to the Database Audit of Database
- **Step 10** On the displayed page, select a payment method.
- **Step 11** After you pay for your order, you can view the creation status of your instances.

----End

Follow-Up Procedure

• If the **Status** of the instance is **Running**, as shown in **Figure 3-5**, you have successfully purchased the database audit instance.

Figure 3-5 Successfully purchasing database audit



• If the instance status is **Creation failed**, as shown in **Figure 3-6**, you will be automatically refunded. You can click **More** in the **Operation** column and view details in the **Failure Details** dialog box.

Figure 3-6 Database audit instance creation failed



3.3 Step 1: Add a Database

Database audit supports databases built on ECS, BMS, and RDS on Huawei Cloud. After purchasing a database audit instance, you need to add the database to be audited to the instance.

For details about the types and versions of databases that can be audited by database audit, see **Supported Database Types and Versions**.

Prerequisites

You have purchased a database audit instance and the **Status** is **Running**.

Adding a Database

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Databases**.
- **Step 4** In the **Instance** drop-down list, select the instance whose database is to be added.
- Step 5 Click Add Database.
- **Step 6** In the dialog box displayed, set the database information, as shown in **Figure 3-7**.

Figure 3-7 Add Database dialog box

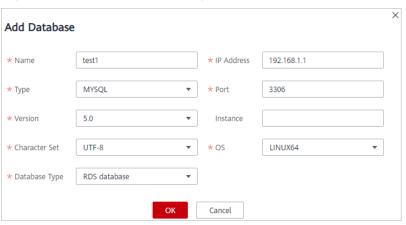


Table 3-6 Parameters

Parameter	Description	Example Value
Name	Custom name of the database to be added	test1

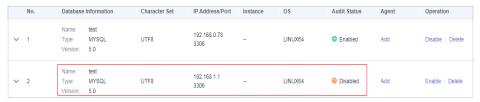
Parameter	Description	Example Value
IP Address	IP address of the database to be added. The IP address must be an internal IP address in IPv4 or IPv6 format.	IPv4: 192.168.1.1 IPv6: fe80:0000:0 000:0000:00 0:0000:000
Туре	Supported database type. The options are as follows: MYSQL ORACLE POSTGRESQL SQLSERVER DWS GaussDB(for MYSQL) GaussDB DAMENG KINGBASE MongoDB Hbase SHENTONG GBase 8a GBase XDM Cluster Greenplum HighGo Mariadb NOTE If ORACLE is selected, to make the audit settings take effect, restart the applications to be audited and log in to the database again.	MYSQL
Port	Port number of the database to be added	3306

Parameter	Description	Example Value
Version	Supported database versions	5.0
	 When Type is set to MYSQL, the following versions are available: 	
	 If RDS database is selected, a list of database instances will be displayed for you to choose from. You do not need to install the agent. 	
	• When Type is set to ORACLE , the following versions are available:	
	- 11g	
	- 12c	
	– 19c	
	When Type is set to POSTGRESQL , the following versions are available:	
	- 7.4	
	- 8.0 8.0, 8.1, 8.2, 8.3, 8.4	
	- 9.0 9.0, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6	
	- 10.0 10.0, 10.1, 10.2, 10.3, 10.4, 10.5	
	- 11.0	
	- 12.0	
	- 13.0	
	When Type is set to SQLSERVER , the following versions are available:	
	- 2008	
	- 2012	
	- 2014	
	- 2016	
	- 2017	
	 When Type is set to DWS, the following versions are available: 	
	- 1.5	
	- 8.1	
	 When Type is set to GaussDB(for MySQL), the following versions are available: 	
	 When Database Type is set to Self-built database, you can select the MySQL 8.0 version. 	

Parameter	Description	Example Value
	 If RDS database is selected, a list of database instances will be displayed for you to choose from. You do not need to install the agent. 	
	• When Type is set to GaussDB , the following version is available:	
	– 1.4 Enterprise Edition	
	When Type is set to DAMENG , the following version is available:	
	 DM8 When Type is set to KINGBASE, the following version is available: 	
	 V8 When Type is set to Hbase, the following versions are available: 	
	- 1.3.1 - 2.2.3	
Instance	Instance name of the database to be audited NOTE If you do not configure the Instance field, database audit will audit all instances in the database.	-
	 If you enter an instance name, database audit will audit the entered instance. Enter a maximum of five instance names and use semicolons (;) to separate instance names. 	
Character Set	Encoding format of the database character set. The options are as follows: UTF-8 GBK	UTF-8
OS	OS of the added database. The options are as follows: • LINUX64 • WINDOWS64	LINUX64
Database Type	Type of the database to be added. Its value can be RDS database or Self-built database.	RDS database

Step 7 Click **OK**. Then a database in the **Disabled** state has been added to the database list. See **Figure 3-8**.

Figure 3-8 Successfully adding a database



■ NOTE

After adding the database, confirm that the database information is correct. If the
database information is incorrect, locate the target database and click **Delete** in the
Operation column, and add the database again.

----End

3.4 Step 2: Enable Database Audit

By default, database audit complies with a **full audit rule**, which is used to audit all databases that are connected to the database audit instance. You can enable audit and check audit results. For details, see **Viewing the Audit Dashboard**.

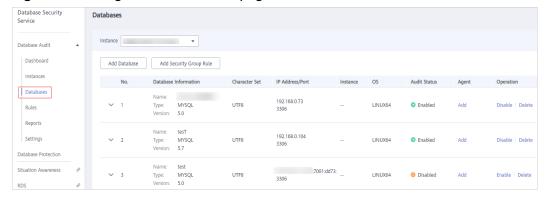
Prerequisites

- You have added and installed an agent, and the agent status is Running.
- A security group rule has been configured for the database audit instance.

Enabling Database Audit

- Step 1 Log in to the management console.
- Step 2 Select a region, click =, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Databases**.

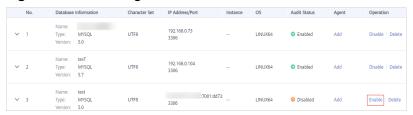
Figure 3-9 Going to the Databases page



- **Step 4** Select a database audit instance from the **Instance** drop-down list.
- **Step 5** In the database list, click **Enable** in the **Operation** column of the database you want to audit.

The **Audit Status** of the database is **Enabled**. You do not need to restart the database.

Figure 3-10 Enabling database audit



----End

Verifying Audit Results

- **Step 1** Run an SQL statement (for example, **show databases**) in the target database.
- Step 2 Log in to the management console.
- Step 3 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 4** In the navigation tree on the left, choose **Data Reports**. The **Data Reports** page is displayed.
- **Step 5** In the **Instance** drop-down list, select the instance that audits the target database.
- Step 6 Click the Statements tab.
- Step 7 Click next to **Time** to set the start and end time, and click **Submit**. The SQL statements entered in **Step 1** will be displayed.

Figure 3-11 Viewing SQL statements



If the entered SQL statement is not displayed, the connection between the
agent and the database audit instance is abnormal. Rectify the fault by
following the instructions in What Do I Do If the Communication Between
the Agent and Database Audit Instance Is Abnormal?

4 Upgrading the Database Audit Instance Version

This section describes how to upgrade your database instance version.

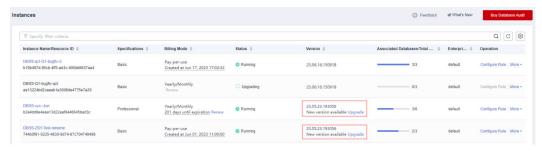
Prerequisites

- You have purchased a database audit instance and the **Status** is **Running**.
- Database audit has been enabled.
- A security group rule has been configured for the database audit instance.
- The database instance version is earlier than the latest version.

Procedure

- Step 1 Log in to the management console.
- Step 2 Select a region, click =, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Instances**.
- **Step 4** Click **Upgrade** in the **Version** column.

Figure 4-1 Upgrading the instance version



Step 5 In the dialog box that is displayed, click **OK**.

5 Configuring Audit Rules

5.1 Adding Audit Scope

By default, database audit complies with a full audit rule, which is used to audit all databases that are successfully connected to database audit. You can also add audit scope and specify the databases to be audited.

NOTICE

By default, the full audit rule takes effect even if other rules exist. To make another audit rule take effect, disable the full audit rule first.

Prerequisites

- You have purchased a database audit instance and the **Status** is **Running**.
- Database audit has been enabled.

Procedure

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree, choose **Rules**.
- **Step 4** In the **Instance** drop-down list, select an instance to add audit scope.
- **Step 5** Add Audit Scope above the audit scope list.

□ NOTE

- By default, database audit complies with a **full audit rule**, which is used to audit all databases that are connected to the database audit instance. This audit rule is enabled by default. You can disable it but cannot delete it.
- To make a custom rule take effect, disable the full audit rule first.

Step 6 In the displayed dialog box, set the audit scope, as shown in **Figure 5-1**. For details about related parameters, see **Table 5-1**.

Figure 5-1 Add Audit Scope dialog box

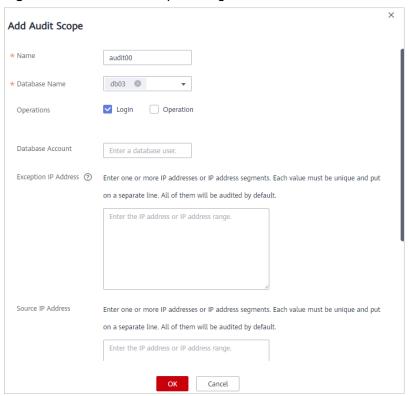


Table 5-1 Parameters

Parameter	Description	Example Value
Name	Name of the custom audit scope	audit00
Database Name	Select a database or ALL .	db03
Operations	Audited operation type. It can be Login or Operation . When you select the Operation check box, you can select All operations or the operations in DDL , DML , and DCL .	Login
Database Account	(Optional) Database username. You can specify multiple accounts, separated by commas (,).	-

Parameter	Description	Example Value
Exception IP Address	(Optional) IP addresses that do not need to be audited.	-
	NOTE If an IP address is set as both a source and an exception IP address, the IP address will not be audited.	
Source IP Address	(Optional) IP address or IP address range used for accessing the database to be audited The IP address must be an internal IP address in IPv4 or IPv6 format.	-
Source Port	(Optional) Port number used for accessing the database to be audited	-

Step 7 Click OK.

When the audit scope is added successfully, it is displayed in the audit scope list in the state of **Enabled**.

----End

Related Operations

In addition to adding the audit scope, you can enable or disable SQL injection detection and add risky operations to set audit rules for database audit.

5.2 Adding an SQL Injection Rule

You can add SQL injection rules to audit your databases.

Prerequisites

- You have purchased a database audit instance and the **Status** is **Running**.
- You have added a database and enabled database audit.
- A database has been added.

Procedure

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** Click **Add Rule** and configure parameters.

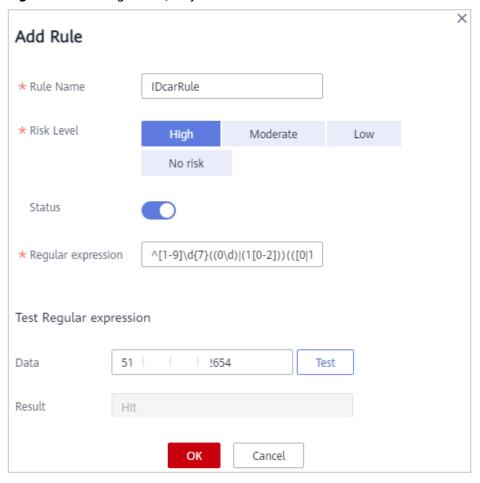


Figure 5-2 Adding an SQL injection rule

Table 5-2 SQL injection rule parameters

Paramet er	Description	Example Value
Name	Name of an SQL rule.	Postal Code SQL injection Rule
Risk Level	Level of risks matching a SQL rule. Its value can be: • High • Moderate • Low • No risk	Moderate
Status	Enables or disables an SQL injection rule. • : enabled • : disabled	

Paramet er	Description	Example Value
Test Regular Expressio n	Regular expression that checks for content in certain pattern.	^\d{6}\$
Data	Content that matches the regular expression.	628307
	Enter content and click Test to verify that the regular expression works properly.	
Result	Test result. It can be:	Hit
	• Hit	
	• Miss	
	NOTE If the test result is Hit , the regular expression is correct.	
	If the test result is Miss , the regular expression is incorrect.	

Step 4 Confirm the information and click **OK**.

----End

5.3 Enabling or Disabling SQL Injection Detection

SQL injection detection is enabled by default. You can disable or enable the detection rules.

NOTICE

One piece of audited data can match only one SQL injection detection rule.

Prerequisites

- You have purchased a database audit instance and the **Status** is **Running**.
- You can enable SQL injection detection when the status is Disabled.
- You can disable SQL injection detection when the status is **Enabled**.

Disabling SQL Injection Detection

SQL injection detection is enabled by default. You can disable the detection rules as required. When an SQL injection detection rule is disabled, the audit rule does not take effect.

Step 1 Log in to the management console.

- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree, choose **Rules**.
- **Step 4** In the **Instance** drop-down list, select the instance for which you want to disable SQL injection detection.
- **Step 5** Click the **SQL Injection** tab.

Only user-defined rules can be edited and deleted. Default rules can only be enabled and disabled.

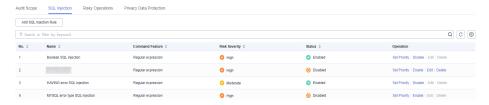
Step 6 In the **Operation** column of a rule, click **Set Priority**. In the displayed dialog box, select a priority. The smallest number indicates the highest priority. Click **OK**.

Figure 5-3 Configuring the priority



Step 7 Locate the SQL injection rule you want to disable, and click **Disable** in the **Operation** column.

Figure 5-4 Disabling an SQL injection detection rule



When the status of an SQL injection detection rule is **Disabled**, SQL injection detection is disabled successfully.

Step 8 In the **Operation** column of a rule, click **Edit**. Configure parameters and click **OK**.

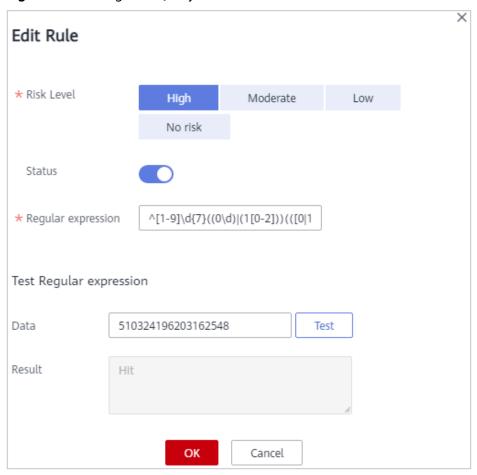


Figure 5-5 Editing an SQL injection rule

Table 5-3 SQL injection rule parameters

Paramet er	Description	Example Value
Name	Name of an SQL rule.	Postal Code SQL injection Rule
Risk Level	Level of risks matching a SQL rule. Its value can be: • High • Moderate • Low • No risk	Moderate
Status	Enables or disables an SQL injection rule. • : enabled • : disabled	

Paramet er	Description	Example Value
Test Regular Expressio n	Regular expression that checks for content in certain pattern.	^\d{6}\$
Data	Content that matches the regular expression.	628307
	Enter content and click Test to verify that the regular expression works properly.	
Result	Test result. It can be:	Hit
	• Hit	
	• Miss	
	NOTE If the test result is Hit , the regular expression is correct.	
	If the test result is Miss , the regular expression is incorrect.	

Step 9 In the **Operation** column, click **Delete**.

----End

Follow-Up Procedure

To restart an SQL injection detection rule, click **Enable** in the **Operation** column of the target rule.

Figure 5-6 Enabling an SQL injection detection rule



When the status of an SQL injection detection rule is **Enabled**, SQL injection detection is enabled successfully.

5.4 Adding Risky Operations

Database audit has built-in rules for detecting data reduction and slow SQL statements. You can also add risky operations and customize detection rules.

NOTICE

One piece of audited data can match only one risky operation rule.

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- Database audit has been enabled.

Procedure

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree, choose **Rules**.
- **Step 4** In the **Instance** drop-down list, select an instance to add risky operations. Click the **Risky Operations** tab. Click **Add** above the risky operation list.
- **Step 5** In the **Instance** drop-down list, select an instance to add risky operations.
- **Step 6** Click the **Risky Operation** tab.
- **Step 7** Click **Add** above the risky operation list.
- **Step 8** On the **Add Risky Operation** page, set the basic information and client IP address, as shown in **Figure 5-7**.

Figure 5-7 Setting the basic information and client IP address

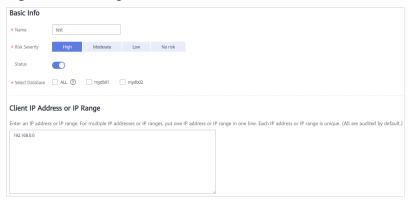


Table 5-4 Parameters

Parameter	Description	Example Value
Name	Custom name of a risky operation	test
Risk Severity	Severity of a risky operation. The options are as follows: • High • Moderate • Low • No risks	High

Parameter	Description	Example Value
Status	Status of a risky operation	
Select Database	Database that the risky operation will be applied to You can select ALL or a specific database.	-
Client IP Address or IP Range	IP address or IP address range of the client The IP address can be an IPv4 address (for example, 192.168.1.1) or an IPv6 address (for example, fe80:0000:0000:0000:0000:0000:0000).	192.168.0.0

Step 9 Set the operation type, operation object, and execution result, as shown in Figure5-8. For details about related parameters, see Table 5-5.

Figure 5-8 Setting the operation type, operation object, and execution result



Table 5-5 Parameters

Parameter	Description	Example Value
Operations	Type of a risky operation, including Login and Operation	Operation
	When you select the Operation check box, you can select All operations or the operations in DDL , DML , and DCL .	
Objects	Enter the target database, target table, and field information after clicking Add Operation Object . Click OK to add an operation object.	-

Parameter	Description	Example Value
Results	Set Affected Rows and Operation Duration. The operation conditions are as follows: • Greater than • Less than • Equal To • Equal to or greater than • Less than or equal to	-

Step 10 Click Save.

----End

5.5 Configuring Privacy Data Protection Rules

To mask sensitive information in entered SQL statements, you can enable the function of masking privacy data and configure masking rules to prevent sensitive information leakage.

Prerequisites

- You have purchased a database audit instance and the **Status** is **Running**.
- Database audit has been enabled.

Procedure

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree, choose **Rules**.
- **Step 4** In the **Instance** drop-down list, select the instance whose privacy data protection rule is to be configured.
- **Step 5** Click the **Privacy Data Protection** tab.
 - □ NOTE

Only user-defined rules can be edited and deleted. Default rules can only be enabled and disabled.

Step 6 Enable or disable **Store Result Set** and **Mask Privacy Data**.

• Store Result Set

You are advised to disable . After this function is disabled, database audit will not store the result sets of user SQL statements.

Do not enable this function if you want to prepare for PCI DSS/PCI 3DS CSS certification.

• Mask Privacy Data

You are advised to enable . After this function is enabled, you can configure masking rules to prevent privacy data leakage.

Step 7 Click **Add Rule**. In the displayed **Add Rule** dialog box, set the data masking rule, as shown in **Figure 5-9**. For details about related parameters, see **Table 5-6**.

Figure 5-9 Add Rule dialog box

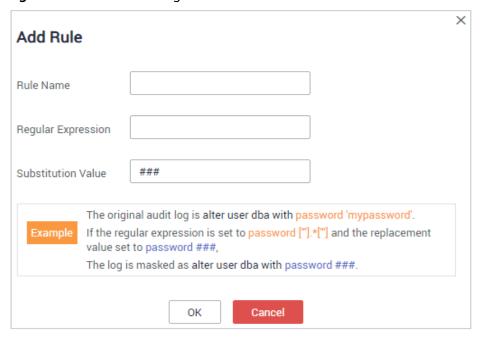


Table 5-6 Rule parameters

Parameter	Description	Example Value
Rule Name	Name of a rule	test
Regular Expression	Regular expression that specifies the sensitive data pattern	-
Substitution Value	Value used to replace sensitive data specified by the regular expression	###

Step 8 Click OK.

A masking rule in the **Enabled** status is added to the rule list.

Verifying a Rule

Perform the following steps to check whether a rule takes effect. The audit information about passport No. in a MySQL database is used as an example.

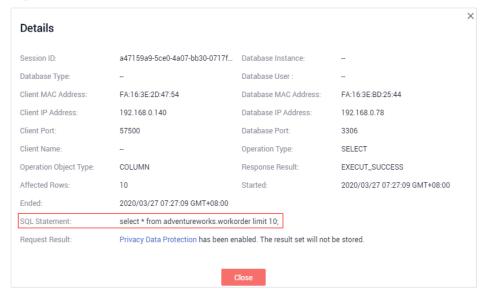
Step 1 Enable **Mask Privacy Data**, and ensure the "Passport NO." masking rule is enabled, as shown in **Figure 5-10**.

Figure 5-10 Enabling privacy data protection



- **Step 2** Log in to the database as user **root** through the MySQL database client.
- Step 3 On the database client, enter an SQL statement.
 select * from db where HOST="Passport NO.";
- **Step 4** In the navigation pane, choose **Dashboard**.
- **Step 5** In the navigation tree on the left, choose **Data Reports**. The **Data Reports** page is displayed.
- **Step 6** In the **Instance** drop-down list, select the instance whose SQL statement information you want to view. Click the **Statements** tab.
- **Step 7** Set filtering conditions to find the entered SQL statement.
- **Step 8** In the row containing the SQL statement, click **Details** in the **Operation** column.
- **Step 9** Check the SQL statement information. The content of **SQL Statement** is shown in **Figure 5-11**, indicating that the masking function is normal.

Figure 5-11 SQL statement with sensitive data masked



----End

Common Operations

After adding a user-defined masking rule, you can perform the following operations on it:

• Disable

Locate the row that contains the rule to be disabled and click **Disable** in the **Operation** column. A disabled rule cannot be used.

Edit

Locate the row that contains the rule to be modified, click **Edit** in the **Operation** column, and modify the rule in the displayed dialog box.

• Delete

Locate the row that contains the rule to be deleted, click **Delete** in the **Operation** column, and click **OK** in the displayed dialog box.

6 Viewing Audit Results

6.1 Viewing SQL Statement Details

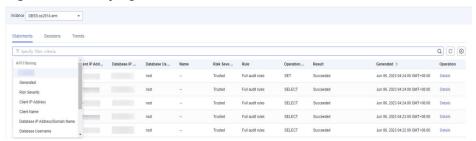
After connecting the database to the database audit instance, view SQL statements of the database.

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- Database audit has been enabled.
- A security group rule has been configured for the database audit instance.

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** Choose **Data Reports**. The **Data Reports** page is displayed.
- **Step 4** In the navigation tree on the left, choose **Data Reports**. The **Data Reports** page is displayed.
- **Step 5** In the **Instance** drop-down list, select the instance whose SQL statement information you want to view.
- **Step 6** Click the **Statements** tab.
- **Step 7** View SQL statement information.

Figure 6-1 Querying SQL statements



To query a specified SQL statement, perform the following steps:

- Select All, Last 30 minutes, 1 hour, 24 hours, 7 days, or 30 days for Time and click Q to view SQL statements of the specified time range.
- Select All, High, Moderate, Low, or Trusted for Risk Severity and click Q. SQL statements of specified severity are displayed in the list.

Ⅲ NOTE

A maximum of 10,000 records can be retrieved in a query.

Step 8 In the row containing the desired SQL statement, click **Details** in the **Operation** column.

Figure 6-2 Viewing details of SQL statements



Step 9 View the SQL statement information in the **Details** dialog box, as shown in **Figure** 6-3. For details about related parameters, see **Table 6-1**.

NOTICE

The maximum length of an audit statement or result set is 10,240 bytes. Excessive parts are not recorded in audit logs.

Details Session ID 29057003 Database Instance Database Type MySQL8.0.22 Database User Client MAC Address Database MAC Address Client IP Address Database IP Address/Domain Name Client Port Database Port 3306 Client Name Operation Type SET Operation Object Type VARIABLE Response Result EXECUT_SUCCESS Affected Rows Jun 06, 2023 04:24:00 GMT+08... Response Received Jun 06, 2023 04:24:00 GMT+08... SQL Statement set @@session.wait_timeout=36000 Request Result

Figure 6-3 Details dialog box

Table 6-1 Parameters for details of SQL statements

Parameter	Description
Session ID	ID of an SQL statement, which is automatically generated
Database Instance	Database where an SQL statement is executed
Database Type	Type of the database where an SQL statement is executed
Database User	Database user for executing an SQL statement
Client MAC Address	MAC address of the client where an SQL statement is executed
Database MAC Address	MAC address of the database where an SQL statement is executed
Client IP Address	IP address of the client where an SQL statement is executed
Database IP Address/Domain Name	IP address or the domain name of the database where an SQL statement is executed
Client Port	Port of the client where an SQL statement is executed
Database Port	Port of the database where the SQL statement is executed
Client Name	Name of the client where an SQL statement is executed
Operation Type	Type of an SQL statement operation

Parameter	Description
Operation Object Type	Type of an SQL statement operation object
Response Result	Response by executing an SQL statement
Affected Rows	Number of rows affected by executing an SQL statement
Started	Time when an SQL statement starts to be executed
Ended	Time when the SQL statement execution ends
SQL Statement	Name of an SQL statement
Request Result	Result of requesting for executing an SQL statement

----End

Helpful Links

• If the entered SQL statement is not displayed, the connection between the agent and the database audit instance is abnormal. Rectify the fault by following the instructions in What Do I Do If the Communication Between the Agent and Database Audit Instance Is Abnormal?

6.2 Viewing Session Distribution

After connecting the database to the database audit instance, view session distribution of the database.

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- Database audit has been enabled.
- A security group rule has been configured for the database audit instance.

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Data Reports**. The **Data Reports** page is displayed.
- **Step 4** In the **Instance** drop-down list, select the instance whose session information you want to view.
- **Step 5** Click the **Sessions** tab.
- **Step 6** View the session distribution chart, as shown in **Figure 6-4**.

- Select All databases or a specified database from the Database drop-down list to view the sessions about all databases in the instance or a specified database.
- Select Last 30 minutes, 1 hour, 24 hours, 7 days, or 30 days, or click to set start time and end time to view the sessions of the specified time range.

Figure 6-4 Viewing session distribution



----End

6.3 Viewing the Audit Dashboard

After connecting the database to the database audit instance, view the audit statistics, including the overall audit statistics, risk distribution, session statistics, and SQL distribution.

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- Database audit has been enabled.
- A security group rule has been configured for the database audit instance.
- The database instance version is 23.05.23.193055 or later. For details, see
 Viewing Trend Analysis.

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Data Reports**. The **Data Reports** page is displayed.
- **Step 4** Click the **Trends** tab. The trend analysis page is displayed.
- **Step 5** In the **Instance** drop-down list, select the instance whose audit information you want to view.
- **Step 6** View the overall audit statistics, risk distribution, session statistics, and SQL distribution.
 - Select **All databases** or a specified database from the **Database** drop-down list to view the statistics about all databases in the instance or a specified database.

• Select Last 30 minutes, 1 hour, Today, 7 days, or 30 days, or click to customize start time and end time to view the statistics of the specified time range.

Figure 6-5 Viewing the audit statistics



Figure 6-6 Risk distribution

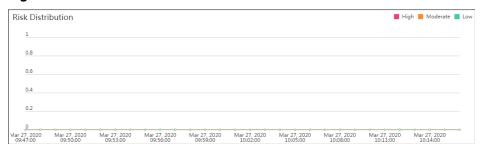


Figure 6-7 Session statistics

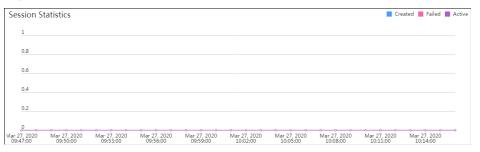
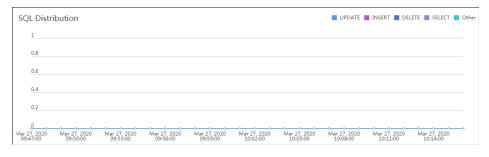


Figure 6-8 SQL distribution



----End

Helpful Links

- If the audit function is unavailable, rectify the fault by following the instructions provided in **Database Audit Is Unavailable**.
- You can configure database audit rules. For details, see **Adding Audit Scope**.

6.4 Viewing Audit Reports

By default, database audit complies with a full audit rule, which is used to audit all databases that are successfully connected to the database audit instance. After connecting the database to the database audit instance, generate an audit report and preview online or download it.

Prerequisites

- You have purchased a database audit instance and the **Status** is **Running**.
- Database audit has been enabled.
- A security group rule has been configured for the database audit instance.

Report Types

Database audit provides eight types of report templates. **Table 6-2** lists the report names. You can generate reports and set report tasks as needed.

Table 6-2 Description

Template Name	Report Types	Description
Database Security General Report	Overview report	Provides the overall audit status of the database, including risks, sessions, and login status to better manage databases.
Database Security Compliance Report	Compliance report	This report helps database administrators and auditors detect abnormal behaviors, locate problems, and manage information.
SOX Report	Compliance report	Complies with the Sarbanes-Oxley Act (SOX) to provide statics on and evaluate database operations. This report helps database administrators and auditors detect abnormal behaviors, locate problems, and manage information.
Database Server Analysis Report	Database report	Provides statistics and analysis on active users, user IP addresses, database logins and requests, database usage duration, and database performance.
Client IP Address Analysis Report	Client report	Provides statistics on client applications, database users, and SQL statements collected from user IP addresses.
DML Command Report	Database operation report	Analyzes user and privileged operations based on DML commands.

Template Name	Report Types	Description
DDL Command Report	Database operation report	Analyzes user and privileged operations based on DDL commands.
DCL Command Report	Database operation report	Analyzes user and privileged operations based on DCL commands.

Step 1: Generating a Report

You can generate reports immediately or periodically. You can also customize the generation time, frequency, and format of reports.

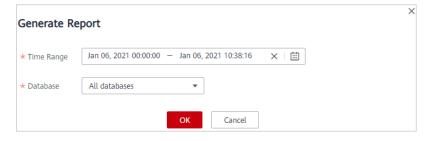
- Method 1: Generating a Report Immediately
- **Step 1** Log in to the management console.
- Step 2 Select a region, click —, and choose Security > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Reports**.
- **Step 4** In the **Instance** drop-down list, select the instance whose instance report you want to generate.
- Step 5 Click the Report Management tab.
- **Step 6** In the **Operation** column of a report template, click **Generate Report**.

Figure 6-9 Report template list



Step 7 In the displayed dialog box, click to set the start time and end time of the report, and select the database for which you want to generate a report, as shown in Figure 6-10.

Figure 6-10 Generate Report



Step 8 Click OK.

----End

- Method 2: Setting Periodic Report Release
- **Step 1** Log in to the management console.
- **Step 2** In the navigation tree on the left, choose **Reports**.
- **Step 3** In the **Instance** drop-down list, select the instance for which you want to set a report task.
- Step 4 Click the Report Management tab.
- **Step 5** Locate the target template and click **Schedule Task** in the **Operation** column, as shown in **Figure 6-11**.

Figure 6-11 Setting a task



Step 6 In the displayed dialog box, set the parameters of the scheduled task, as shown in **Figure 6-12**. For details about related parameters, see **Table 6-3**.

Figure 6-12 Setting a scheduled task

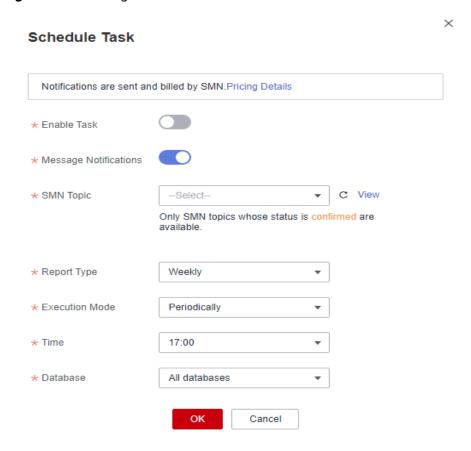


Table 6-3 Parameters for setting a task

Parameter	Description	Example Value
Enable Task	Status of a scheduled task.	
	• : enabled	
	• : disabled	
Message	Enables or disables notifications.	
Notifications	Notifications are sent by Simple SMN and will probably incur a small fee. See SMN Pricing Details.	
	• enabled	
	• consistence : disabled	
Report Type	Type of a report. The options are as follows:	Weekly
	Daily Weekly	
	Monthly	
Execution Mode	Execution mode of the report. The options are as follows:	Periodically
	Once	
	Periodically	
Time	Time when the report is executed	10:00
Database	Database for which you want to execute the report task	-

Step 7 Click OK.

----End

Step 2: Previewing and Downloading Audit Reports

Before previewing or downloading an audit report, ensure that its Status is 100%.

NOTICE

To preview a report online, use Google Chrome or Mozilla FireFox.

- **Step 1** Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.

- **Step 3** In the navigation tree on the left, choose **Reports**.
- **Step 4** In the **Instance** drop-down list, select the instance whose report you want to preview or download.
- **Step 5** Locate the target template, and click **Preview** or **Download** in the **Operation** column to preview or download the report. See **Figure 6-13**..

Figure 6-13 Previewing or downloading an audit report



----End

Helpful Links

Why I Cannot Preview the Database Security Audit Report Online?

6.5 Viewing Trend Analysis

After connecting the database to the database audit instance, you can view the statement trend analysis (including statement quantity, session statistics, and SQL distribution) and risk trend analysis (including risk distribution, SQL injections, and risky operations).

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- Database audit has been enabled.
- A security group rule has been configured for the database audit instance.
- This function is supported by database instance of 23.05.23.193055 and later versions.

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Data Reports**. The **Data Reports** page is displayed.
- **Step 4** Click the **Trends** tab. The trend analysis page is displayed.
- **Step 5** In the **Instance** drop-down list, select the instance whose audit information you want to view.
- **Step 6** View the overall trend of the database.
 - Click **Re-analyze** on the right of the console.

- Select All databases or a specified database from the Database drop-down list to view the statistics about all databases in the instance or a specified database.
- Select Last 30 minutes, 1 hour, Today, 7 days, or 30 days, or click to customize start time and end time to view the statistics of the specified time range.

Figure 6-14 Re-analyze

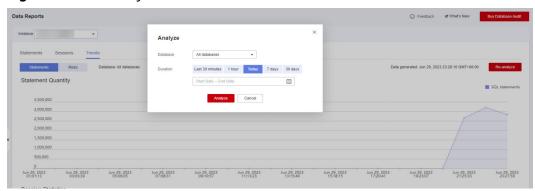


Figure 6-15 Statements

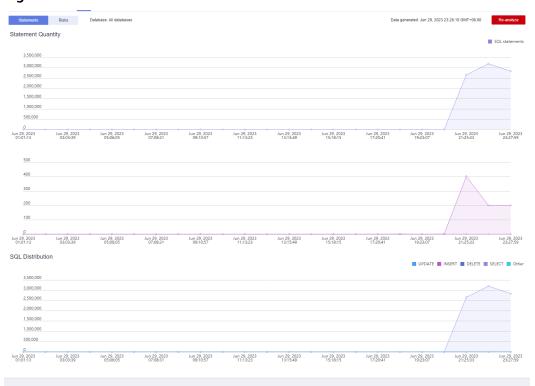
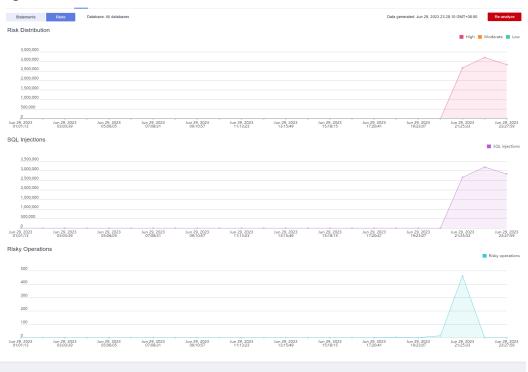


Figure 6-16 Risks



----End

Configuring Alarm Notifications

7.1 Configuring Email Notifications

After enabling email notifications, you can receive an email when an alarm is triggered or an audit report is generated.

Prerequisites

You have purchased a database audit instance and the **Status** is **Running**.

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Settings**.
- **Step 4** In the **Instance** drop-down list, select an instance to configure email settings
- **Step 5** Configure the email notification. **Table 7-1** describes the parameters

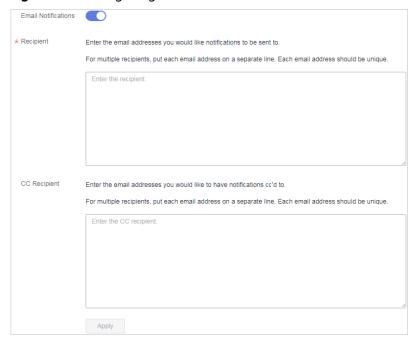


Figure 7-1 Configuring email notifications

Table 7-1 Parameters

Parameter	Description	Example Value
Email Notifications	Status of the email notification function. By default, Email Notifications is enabled for database audit. You will receive an email when a configured alarm is triggered or an audit report is generated.	
Recipient	Email address of the recipient	-
CC Recipient	Optional. Email address of the CC recipient	-

Step 6 Click Apply.

----End

7.2 Configuring Alarm Notifications

After configuring alarm notifications, you can receive DBSS alarms on database risks. If this function is not enabled, you have to log in to the management console to view alarms.

- Alarm notifications may be mistakenly blocked. If you have enabled notifications but not received any, check whether they have been blocked as spasms.
- The system collects alarm statistics every 5 minutes and sends alarm notifications (if any).

 Database audit alarm notifications are sent by SMN and will incur fees. See SMN Pricing Details.

Prerequisites

You have purchased a database audit instance and the **Status** is **Running**.

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Settings**.
- **Step 4** In the **Instance** drop-down list, select an instance to configure alarm notifications.
- **Step 5** Click the **Alarm Notifications** tab.
- **Step 6** Set alarm notifications. For details about related parameters, see **Table 7-2**.

Global Settings Message Notifications C View * SMN Topic test Only SMN topics whose status is confirmed are available. Daily Alarm Notifications Alarm Settings for Risky Operations High Moderate Alarm Risk Severity Alarm Settings for System Resources CPU Alarm Threshold (%) 80 Memory Alarm Threshold (%) Disk Alarm Threshold (%) 80 Apply

Figure 7-2 Configuring alarm notifications

Table 7-2 Alarm notification parameters

Parameter	Description	Example Value
Message Notifications	Enables or disables notifications. Database audit alarm notifications are sent by SMN and will probably incur a small fee. See SMN Pricing Details.	
SMN Topic	Select an existing topic from the drop-down list or click View to create a topic. For details, see Creating a Topic .	-
	 You can add multiple subscriptions to a topic and select multiple subscription endpoints (such as SMS messages and emails). For details, see Adding a Subscription. 	
	NOTE Before selecting a topic, ensure that the subscription status of the topic is Confirmed . Otherwise, alarm notifications may not be received.	
	For details about topics and subscriptions, see Simple Message Notification User Guide.	
Daily Alarm Notifications	Total number of alarms allowed to be sent every day NOTICE	30
	 If the number of alarms exceeds this value on a day, no more notification will be sent on that day. 	
	There is no fixed time point for sending alarm notifications. The system collects statistics every 5 minutes and sends alarm notifications (if any).	
Alarm Risk Severity	Risk severity of the risk log. The options are as follows:	High
	• High	
	Moderate Low	
CPU Alarm Threshold (%)	CPU alarm threshold of an audit instance. When the threshold is exceeded, an alarm notification is generated.	80
Memory Alarm Threshold (%)	Memory alarm threshold of an audit instance. When the threshold is exceeded, an alarm notification is generated.	80
Disk Alarm Threshold (%)	Disk alarm threshold of an audit instance. When the threshold is exceeded, an alarm notification is generated.	80

Step 7 Click Apply.

----End

8 Viewing Monitoring Information

8.1 Viewing the System Monitoring

This section describes how to view the system monitoring of database audit and learn about system resources and traffic usage.

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- Database audit has been enabled.

Procedure

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Instances**.
- **Step 4** Click an instance name and then click the **Monitoring** tab. The **System Monitoring** page is displayed.
- **Step 5** View the system monitoring information, as shown in Figure 8-1.

Select Last 30 minutes, 1 hour, 24 hours, 7 days, or 30 days, or click to customize start time and end time to view the system monitoring information of the specified time range.

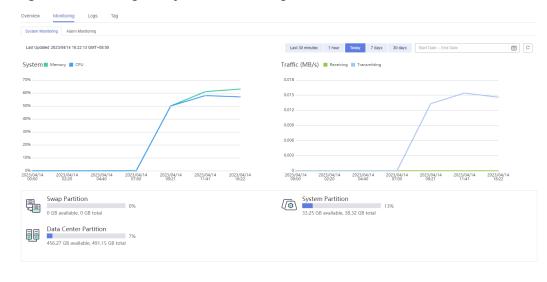


Figure 8-1 Viewing the system monitoring

----End

8.2 Viewing the Alarms

This section describes how to view and confirm alarms of database audit.

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- Database audit has been enabled.
- You have configured alarm notifications.

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Instances**.
- **Step 4** Click the name of an instance, click the **Monitoring** tab, and then the **Alarm Monitoring** tab.
- **Step 5** View the alarm information, as shown in **Figure 8-2**. For details about related parameters, see **Table 8-1**.





Table 8-1 Parameters of alarms

Parameter	Description	
Time	Time when an alarm occurred.	
Туре	Alarm type. The options are as follows: Risky operations CPU exceptions Memory exceptions Disk exceptions Insufficient audit log storage Log backup to OBS failed Agent exceptions	
Alarm Risk Severity	Risk severity of an alarm. The options are as follows: • High • Moderate • Low	
Cleared	Time when an alarm is cleared	
Confirmed Or Not	Confirmation status of an alarm. Click \overline{V} to filter alarms in Unconfirmed or Confirmed state.	
Description	Description of an alarm	

To query specified alarms, perform the following steps:

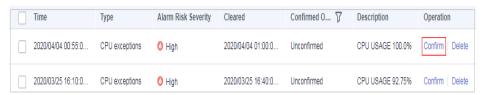
- Select Last 30 minutes, 1 hour, 24 hours, 7 days, or 30 days for Time, and click to view alarms of the specified time range.
- Select **All**, **High**, **Moderate**, or **Low** for **Risk Severity**. Alarms of specified severity are displayed in the list.
- Select an alarm type, and alarms of specified alarm type is displayed in the

----End

Follow-Up Procedure

To confirm an alarm, click **Confirm** in the **Operation** column of the alarm.

Figure 8-3 Confirming an alarm



□ NOTE

You can select multiple alarms to be confirmed and click **Batch Confirm** to batch confirm alarms.

9 Backing Up and Restoring Database Audit Logs

Database audit logs can be backed up to OBS buckets to achieve high availability for disaster recovery. You can back up or restore database audit logs as required.

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- Database audit has been enabled.

Precautions

 Audit logs are backed up to OBS. Buckets are automatically created for you and billed per use.

OBS Fine-grained Authorization

DBSS backup and restoration require OBS permissions. Users without IAM authorization permissions must be manually authorized by a user having the **Security Administrator** permission.

- Step 1 Log in to the management console.
- Step 2 Select a region, click in the upper left corner, and choose Management & Governance > Identity and Access Management.
- **Step 3** In the navigation pane, choose **Permissions** > **Authorization**. Click **Create Custom Policy**.
- **Step 4** Configure policy parameters. Set **Policy Name** to **DBSS OBS Agency Access**. Set **Policy View** to **JSON**. The policy content is as follows:

```
"obs:object:GetObjectVersionAcl",
    "obs:object:GetObjectVersionAcl",
    "obs:bucket:HeadBucket",
    "obs:bucket:CreateBucket",
    "obs:bucket:ListBucket",
    "obs:object:PutObject"

],
    "Resource": [
    "OBS:*:*:object:*",
    "OBS:*:*:bucket: OBS_Bucket_Name_1",
    "OBS:*:*:bucket: OBS_bucket_2" //You can add multiple buckets.

]

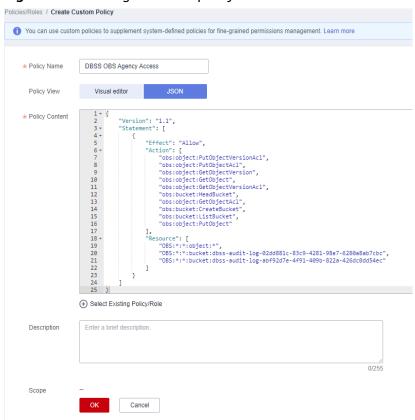
}

]

}
```

See Figure 9-1. Click OK.

Figure 9-1 Creating a custom policy



- **Step 5** In the navigation pane, choose **Agencies** and then click **Create Agency** in the upper right corner.
- Step 6 Configure agency parameters. Set Agency Name to dbss_depend_obs_trust. Set Agency Type to Cloud service. Set Cloud Service to DBSS. See Figure 9-2.

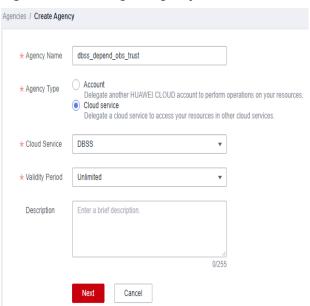


Figure 9-2 Creating an agency

Step 7 Click Next. Select the custom policy created in Step 4, and add the permission DBSS OBS Agency Access to the agency dbss_depend_obs_trust, as shown in Figure 9-3. Click Next in the lower right corner.

Figure 9-3 Selecting a policy



Step 8 Set **Scope** to **All resources** and click **OK**. If the message in **Figure 9-4** is displayed, the authorization is successful. Click **Finish**. The authorization will take effect in about 15 minutes.

Figure 9-4 Authorization completed



----End

Automatically Backing Up Database Audit Logs

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Settings**.
- **Step 4** In the **Instance** drop-down list, select the required instance and click the **Backup** and **Restoration** tab.
- **Step 5** Click **Configure**. In the displayed dialog box, set the parameters, as shown in **Figure 9-5**. For details about related parameters, see **Table 9-1**.

Figure 9-5 Configure Automatic Backup dialog box

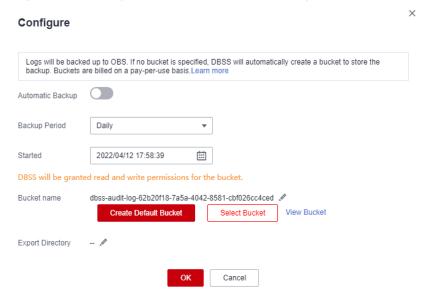


Table 9-1 Parameters

Parameter	Description	Example Value
Automatic Backup	Status of automatic backup	
Backup Period	Automatic backup period. Its options are as follows:	Daily
	Daily	
	Hourly	
Started	Start time of the backup. Click ito configure.	2020/01/14 20:27:08

Parameter	Description	Example Value
Bucket Name	Name of the OBS bucket used for backup. Its options are as follows:	20f18-7a5a- 4042
	Create Default Bucket	
	Select Bucket	
	NOTE	
	 If you click Create Default Bucket, you will be prompted to authorize OBS for exporting audit log backups. 	
	 Audit logs can be exported only to the bucket created by DBSS. 	
Export Directory	Directory for storing backup files in the OBS bucket.	test

Step 6 Click OK.

After the automatic backup function is configured, new data in the database will be backed up one hour later. Then you can view the backup information.

----End

Restoring Database Audit Logs

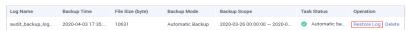
After backing up database audit logs, you can restore the audit logs as required.

NOTICE

Restoring logs is risky. Therefore before restoring logs, ensure that the backup log data is correct or complete.

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Settings**.
- **Step 4** In the **Instance** drop-down list, select the required instance and click the **Backup** and **Restoration** tab.
- **Step 5** In the **Operation** column of the backup log to be restored, click **Restore Log**, as shown in **Figure 9-6**.

Figure 9-6 Restoring logs



Step 6 In the displayed dialog box, click **OK**.

----End

Exporting Risk Data

You can export the logs that record high-risk operations to OBS. An OBS bucket will be automatically created to store these logs and will charge per use.

Before you enable risk export, perform operations in **OBS Fine-grained Authorization**.

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Settings**.
- **Step 4** In the **Instance** drop-down list, select the required instance and click the **Risk Export** tab.
- **Step 5** Click in the row of a database to export risk data. An OBS bucket will be automatically created to store risk logs. See **Figure 9-7**.
 - Bucket Name:Click Create Default Bucket or Select Bucket.
 - **Export Directory**: Create a directory for storing risk files in the OBS bucket.

Figure 9-7 Automatically creating an OBS bucket



----End

10 Other Operations

10.1 Managing Database Audit Instances

After purchasing a database audit instance, you can view, enable, restart, and disable the instance.

Prerequisites

- Before restarting and disabling an instance, ensure that its Status is Running.
- Before enabling an instance, ensure that its **Status** is **Disabled**.

Viewing the Instance

- Step 1 Log in to the management console.
- Step 2 Select a region, click ____, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Instances**.
- **Step 4** View the database audit instances information. For details about related parameters, see **Table 10-1**.

Figure 10-1 Viewing database audit instances



Ⅲ NOTE

- You can click the name of an instance to view its overview.
- Select an instance status from the All statuses drop-down list in the upper right corner
 of the list, or enter a key word of an instance to search for it.

Table 10-1 Parameters

Parameter	Description	
Instance Name/ID	Name and ID of an instance. Instance ID is automatically generated.	
Specificatio ns	Edition of an instance	
Billing Mode	Billing mode (yearly/monthly) and expiration time of the instance	
Status	Running status of an instance. The options are as follows: Running Creating Faulty Disabled Frozen Frozen for legal management Frozen due to abuse Frozen due to lack of identity verification Frozen for partnership Creation failed	
Associated Databases/ Total Databases	Number of databases an instance has associated with and Number of databases an instance supports	
Enterprise Project	Enterprise project name of the instance	
Operation	Operations can be performed on the instance. The options are as follows: Configure Rules Enable Disable Restart View Details View Metric Delete	

□ NOTE

You can perform the following operations on instances as required:

Restart

Locate the row that contains the desired instance, choose **More** > **Restart** in the **Operation** column, and click **OK** in the displayed dialog box.

Enable

Locate the row that contains the desired instance, choose **More** > **Enable** in the **Operation** column, and click **OK** in the displayed dialog box.

Disable

Locate the row that contains the desired instance, choose **More** > **Disable** in the **Operation** column, and click **OK** in the displayed dialog box. When an instance is disabled, the audit function is disabled for the databases on the instance.

Delete

Locate the row that contains the instance that failed to be created, choose **More** > **Delete** in the **Operation** column, and click **Delete** in the displayed dialog box. Deleted instances will not be displayed in the instance list.

View Details

Locate the row that contains the instance that failed to be created, choose **More** > **View Details** in the **Operation** column. In the dialog box that is displayed, view the instance creation failure details.

----End

10.2 Viewing the Instance Overview

This section describes how to view the instance overview, including the basic information, network settings and associated databases.

Prerequisites

You have purchased a database audit instance and the **Status** is **Running**.

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Instances**.
- **Step 4** Click the name of the instance whose information you want to view. The **Overview** page is displayed.
- **Step 5** View the basic information, network settings, and associated databases about the instance. See **Figure 10-2**. For details about related parameters, see **Table 10-2**.

Figure 10-2 Viewing the instance overview

Table 10-2 Parameters of the instance overview

Categor	Parameter	Description
У		
Basic Info	Name	Name of an instance. You can click unext to Name to change it.
	Status	Running status of an instance. The options are as follows:
		Running
		Creating
		Faulty
		Disabled
		Frozen
		Frozen for legal management
		Frozen due to abuse
		Frozen due to lack of identity verification
		Frozen for partnership
		Creation failed
	ID	Instance ID, which is automatically generated
	AZ	Availability Zone (AZ) where an instance resides
	Version	Version of an instance
	Remarks	Remarks about an instance Click 🔑 next to remarks to modify it.
	Edition	Edition of an instance
	Billing Mode	Billing mode of an instance
	Created	Time when an instance is created
	Enterprise Project	Enterprise project that the instance belongs to.

Categor y	Parameter	Description
	Remaining Period (day)	Remaining days for which an instance can be used
Network Settings	VPC	VPC where an instance resides
	Security Group	Security group where an instance resides
	Subnet	Subnet where an instance resides
	Private IP Address	IP address of an instance
Associate d Databas e	-	Database information associated with an instance
		Click Manage Database , and the Databases page is displayed. For details about how to add a database, see Step 1: Add a Database .

----End

10.3 Managing Databases and Agents

After adding a database successfully, you can view, disable or delete the database. After adding an agent to the database, you can view, disable or delete the agent.

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- You have added a database successfully.
- Before disabling a database, ensure that Audit Status of the database is Enabled.

Viewing the Database Information

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Databases**.
- **Step 4** In the **Instance** drop-down list, select the instance whose database you want to view.
- **Step 5** View the database information. For details about related parameters, see **Table 10-3**.

Instance GBSS-25Y-Rest

Add Security Group Rule

V Specify filter culturia.

Database Information © Character Set © P Address(Domain ... © Installing Note ... © P Address(Domain ... © P Address(Domain ... © Installing Note ... © P Address(Domain ... © P Installing Note ... © P Installing Note ... © P Installing Note ... © Installing Note ... ©

Figure 10-3 Viewing the database and agent information

◯ NOTE

Select an audit status from the **All audit statuses** drop-down list in the upper right corner of the list, or enter a key word of a database to search for it.

Table 10-3 Parameters

Parameter	Description	Example Value
Database Information	Name, type, and version of a database	-
Character Set	Encoding character set of the database	UTF8
IP Address/ Port	IP address of the database	192.168.0.10 4
		3306
Instance	Database instance name	-
OS	Operating system of the database	LINUX64
Audit Status	Audit status of the database. The options are as follows:	Enabled
	• Enabled	
	Disabled	
Agent	Click Add to add an agent for the database.	Add an agent.

■ NOTE

You can perform the following operations on a database you added:

- Disable
 - Locate the row that contains the database to be disabled, click **Disable** in the
 Operation column, and click **OK** in the displayed dialog box. The **Audit Status** of the database will change to **Disabled**.
 - When a database is disabled, database audit is disabled for the database.
- Delete
 - Locate the row that contains the database to be deleted, click **Delete** in the Operation column, and click **OK** in the displayed dialog box.
 - You need to add the database again if a database is deleted and you want to audit the database.

----End

Viewing an Agent

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Databases**.
- **Step 4** In the **Instance** drop-down list, select the instance whose agent you want to view.
- Step 5 Click ✓ on the left of the database to expand the agent details, as shown in Figure 10-4. For details about related parameters, see Table 10-4.

Figure 10-4 Viewing the database and agent information

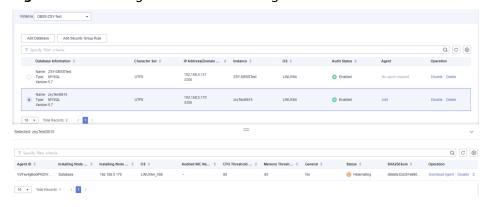


Table 10-4 Parameters of an agent

Parameter	Description		
Agent ID	Agent ID, which is automatically generated		
Installing Node Type	Type of the installing node. The options are Database and Application .		

Parameter	Description		
Installing Node IP Address	IP address of the node where an agent is installed		
OS	Agent OS		
Audited NIC Name	NIC name of an installing node		
CPU Threshold (%)	CPU threshold of the installing node. The default value is 80 . NOTE The agent on a node will stop working if the CPU usage of the node exceeds this threshold. You can scale up CPU resources to avoid this problem.		
Memory Threshold (%)	Memory threshold of the installing node. The default value is 80 . NOTE The agent on a node will stop working if the memory usage of the node exceeds this threshold. You can scale up memory resources to avoid this problem.		
General	Whether an agent is a general-purpose agent.		
SHA256Sum	Verification value of the agent installation package.		
Status	Running status of the installing node		

Ⅲ NOTE

You can perform the following operations on an agent you added:

- Disable
 - Locate the row that contains the agent to be disabled, click **Disable** in the
 Operation column, and click **OK** in the displayed dialog box. The status of the
 agent will change to **Disabled**.
 - When an agent is disabled, database audit is disabled for the associated database.
- Delete
 - Locate the row that contains the agent to be deleted, click **Delete** in the Operation column, and click **OK** in the displayed dialog box.
 - After an agent is deleted, add another agent again if you want to audit the database.

----End

10.4 Uninstalling an Agent

You can uninstall an agent from the database or application if you do not need to audit the database.

Prerequisites

You have installed an agent on the desired node.

Uninstalling the Agent from a Linux OS

- **Step 1** Log in to the node where the agent is installed as user **root** using SSH through a cross-platform remote access tool (such as PuTTY).
- **Step 2** Run the following command to access the directory where the decompressed **xxx.tar.qz** agent installation package is stored:
 - **cd** directory containing the decompressed agent installation package
- **Step 3** Run the following command to check whether you have the permission for executing the **uninstall.sh** script:

ll

- If you do, go to Step 4.
- If you do not, perform the following operations:
 - Run the following command to get the script execution permission:
 chmod +x uninstall.sh
 - b. Verify you have the required permissions.
- **Step 4** Run the following command to uninstall the agent:

sh uninstall.sh

If the following information is displayed, the agent has been uninstalled successfully:

uninstall audit agent...
exist os-release file
stopping audit agent
audit agent stopped
stop audit_agent success
service audit_agent does not support chkconfig
uninstall audit agent completed!

----End

Uninstalling the Agent from a Windows OS

- **Step 1** Enter the directory where the agent installation file is stored.
- **Step 2** Double-click the **uninstall.bat** file to uninstall the agent.
- **Step 3** Verify the agent has been uninstalled.
 - 1. Open the Task Manager and verify the dbss_audit_agent process is stopped.
 - 2. Verify the entire agent installation directory has been deleted.

----End

10.5 Management an Audit Scope

After adding an audit scope, you can view, enable, edit, disable, or delete the audit scope.

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- The audit scope has been added.
- Before enabling, editing, or deleting the audit scope, ensure that the status of audit scope is **Disabled**.
- Before disabling the audit scope, ensure that the status of audit scope is Enabled.

Precautions

By default, database audit complies with a **full audit rule**, which is used to audit all databases that are connected to the database audit instance. This audit rule is enabled by default. You can disable it but cannot delete it.

Viewing the Audit Scope

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree, choose **Rules**.
- **Step 4** In the **Instance** drop-down list, select an instance to view audit scope.
- **Step 5** View the audit scope information. For details about related parameters, see **Table 10-5**.

Figure 10-5 Viewing the audit scope



□ NOTE

Enter the key word of an audit scope to search.

Table 10-5 Parameters

Parameter	Description		
Name	Name of the audit scope		
Exception IP Address	Whitelisted IP addresses within the audit scope		
Source IP Address	IP address or IP address range used for accessing the database		
Source Port	Port number of the IP address to be audited		

Parameter	Description		
Database Name	Database in the audit scope		
Database Account	Database username		
Status	Status of the audit scope. The options are as follows: • Enabled • Disabled		

NOTE

You can perform the following operations on audit scopes as required:

- Fnable
 - Locate the row that contains the audit scope to be enabled, and click **Enable** in the **Operation** column. Databases within the scope will be audited.
- Edit (supported in customized audit scopes only)
 Locate the row that contains the audit scope to be edited, click Edit in the Operation column, and modify the scope in the displayed dialog box.
- Disable
 - Locate the row that contains the audit scope to be disabled, click **Disable** in the **Operation** column, and click **OK** in the displayed dialog box. When the audit scope is disabled, the audit scope rule will not be executed in the audit.
- Delete (supported in customized audit scopes only)
 - Locate the row that contains the audit scope to be deleted, click **Delete** in the **Operation** column, and click **OK** in the displayed dialog box. You need to add the audit scope again if it is deleted and you want to audit it.

----End

10.6 Viewing Information About SQL Injection Detection

This section describes how to view SQL injection detection information of a database audit instance.

Prerequisites

- You have purchased a database audit instance and the **Status** is **Running**.
- Database audit has been enabled.

Procedure

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.

- **Step 3** In the navigation tree, choose **Audit Rules**.
- **Step 4** In the **Instance** drop-down list, select the instance for which you want to view SQL injection detection. Click the **SQL Injection** tab.
- **Step 5** View information about SQL injection detection, as shown in **Figure 10-6**. For details about related parameters, see **Table 10-6**.

Figure 10-6 Viewing information about the SQL injection detection



□ NOTE

- Select a risk severity from the **All risk severities** drop-down list in the upper right corner of the list, or enter a key word of an SQL injection rule name to search.
- Click **Set Priority** in the **Operation** column of an SQL injection rule to change its priority.

Table 10-6 Parameters

Parameter	Description			
Name	Name of the SQL injection detection			
Command Feature	Command features of the SQL injection detection			
Risk Severity	Risk level of the SQL injection detection. The options are as follows:			
	High			
	Moderate			
	• Low			
	No risks			
Status	Status of the SQL injection detection. The options are as follows:			
	Enabled			
	• Disabled			
Operation	Operations on an SQL injection rule. The options are as follows:			
	Set Priority			
	Disable			
	• Edit			
	• Delete			

10.7 Managing Risky Operations

After adding a risky operation, you can view the risk, enable, edit, disable, or delete the risky operation, or set its priority.

Prerequisites

- You have purchased a database audit instance and the **Status** is **Running**.
- The risky operation has been added.
- Before enabling the risky operation, ensure that its status is **Disabled**.
- Before disabling the risky operation, ensure that its status is Enabled.

Sets the Priority of the Risky Operation

- Step 1 Log in to the management console.
- Step 2 Select a region, click ___, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree, choose **Rules**.
- **Step 4** In the **Instance** drop-down list, select an instance to set risky operation priority. Click the **Risky Operations** tab.
- **Step 5** Locate the target risky operation, and click **Set Priority** in the **Operation** column, as shown in **Figure 10-7**.

Figure 10-7 Setting the priority



Step 6 In the displayed dialog box, select a priority and click **OK**.

----End

Viewing the Risky Operation

- **Step 1** Log in to the management console.
- Step 2 Select a region, click =, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree, choose **Rules**.
- **Step 4** In the **Instance** drop-down list, select an instance to view risky operations.
- **Step 5** Click the **Risky Operations** tab.
- **Step 6** View the risky operation information. For details about related parameters, see **Table 10-7**.

Figure 10-8 Viewing risky operations



□ NOTE

Select a risk severity from the **All risk severities** drop-down list in the upper right corner of the list, or enter a key word of a risky operation name to search.

Table 10-7 Parameters

Parameter	Description		
Name	Name of the risky operation		
Category	Category of the risky operation		
Feature	Feature of the risky operation		
Risk Severity	Risk severity of the risky operation. The options are as follows: High Moderate Low No risks		
Status	Status of the risky operation. The options are as follows: • Enabled • Disabled		

Ⅲ NOTE

You can perform the following operations on risky operations as required:

Enable

Locate the row that contains the risky operation to be enabled, and click **Enable** in the **Operation** column. The operation will be audited.

Edit

Locate the row that contains the risky operation to be edited, click **Edit** in the **Operation** column, and modify the operation in the displayed dialog box.

Disable

Locate the row that contains the risky operation to be disabled, click **Disable** in the **Operation** column, and click **OK** in the displayed dialog box. When a risky operation is disabled, the risky operation rule will not be executed in the audit.

Delete

Locate the row that contains the risky operation to be deleted, click **Delete** in the **Operation** column, and click **OK** in the displayed dialog box. You need to add the risky operation again if a risky operation is deleted and you need to audit its rule.

----End

10.8 Managing Privacy Data Protection Rules

You can view, enable, edit, disable, or delete data masking rules.

Prerequisites

You have purchased a database audit instance and the **Status** is **Running**.

Viewing Privacy Data Protection Rules

- Step 1 Log in to the management console.
- Step 2 Select a region, click ___, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree, choose **Rules**.
- **Step 4** In the **Instance** drop-down list, select an instance to view its privacy data protection rule.
- **Step 5** Click the **Privacy Data Protection** tab.
 - □ NOTE

Only user-defined rules can be edited and deleted. Default rules can only be enabled and disabled.

Step 6 View the rules. For details about related parameters, see **Table 10-8**.

◯ NOTE

Store Result Set

You are advised to disable . After this function is disabled, database audit will not store the result sets of user SQL statements.

Do not enable this function if you want to prepare for PCI DSS/PCI 3DS CSS certification.

• Mask Privacy Data

You are advised to enable . After this function is enabled, you can configure masking rules to prevent privacy data leakage.

Figure 10-9 Masking rule information



Table 10-8 Masking rule parameters

Parameter	Description	
Rule Name	Rule name	
Rule Type	Rule type. • Default • User-defined	
Regular Expression	Regular expression that specifies the sensitive data pattern	
Substitutio n Value	Value used to replace sensitive data specified by the regular expression	
Status	Status of a rule. Its value can be: • Enabled • Disabled	

■ NOTE

You can perform the following operations on a rule:

- Disable
 - Locate the row that contains the rule to be disabled and click **Disable** in the **Operation** column. A disabled rule cannot be used.
- Edit
 - Locate the row that contains the rule to be modified, click **Edit** in the **Operation** column, and modify the rule in the displayed dialog box.
- Delete
 - Locate the row that contains the rule to be deleted, click **Delete** in the **Operation** column, and click **OK** in the displayed dialog box.

----End

10.9 Managing Audit Reports

By default, database audit complies with a full audit rule, which is used to audit all databases that are successfully connected to the database audit instance. After connecting the database to the database audit instance, view report templates and report results.

Prerequisites

- You have purchased a database audit instance and the **Status** is **Running**.
- Database audit has been enabled.
- Audit reports have been generated.

Viewing a Report

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Reports**.
- **Step 4** In the **Instance** drop-down list, select the instance whose report information you want to view.
- **Step 5** Viewing reports

Figure 10-10 Viewing a report



◯ NOTE

- Enter a report name in the upper right corner to search.
- A real-time report is automatically generated in PDF format.
- Locate the row that contains the report to be deleted, click **Delete** in the **Operation** column, and click **OK** in the displayed dialog box. When a report is deleted, you need to manually generate a report if you want to view the report result.

----End

Viewing a Report Template

- Step 1 Log in to the management console.
- Step 2 Select a region, click , and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Reports**.
- **Step 4** In the **Instance** drop-down list, select the instance whose report template you want to view.
- **Step 5** Click the **Report Management** tab.
- **Step 6** View the report template information, as shown in **Figure 10-11**.

Figure 10-11 Viewing the template list



- Report types include Compliance report, Overview report, Database report, Client report, and Database operation report.
- You can enable or disable scheduled tasks, or set their frequency to daily, weekly, or monthly.
- To modify the scheduled task of a report template, click Schedule Task in the
 Operation column. Modify and save the settings, click Generate Report, and you can
 check the reports.

----End

10.10 Managing Backup Audit Logs

After backing up audit logs, you can view or delete backup audit logs.

Prerequisites

- You have purchased a database audit instance and the Status is Running.
- Database audit has been enabled.
- You have backed up audit logs.

Viewing Backup Audit Logs

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Settings**.
- **Step 4** In the **Instance** drop-down list, select the instance whose log template you want to view.
- **Step 5** Click the **Backup and Restoration** tab.
- **Step 6** View the backup audit log information, as shown in **Figure 10-12**. For details about related parameters, see **Table 10-9**.

Figure 10-12 Viewing backup audit logs



Click in the upper right corner of the list and select the start time and end time to view backup logs in a specified time range.

Table 10-9 Parameters of audit logs

Parameter	Description		
Log Name	Name of a log, which is automatically generated		
Backup Time	Time when a log is backed up		
File Size	Log file size		
Backup Mode	Log backup mode.		
Backup Scope	Backup time window		
Task Status	Backup status of a log		

◯ NOTE

Locate the row that contains the log to be deleted, click **Delete** in the **Operation** column, and click **OK** in the displayed dialog box.

----End

10.11 Viewing Operation Logs

This section describes how to view operation logs of a database audit instance.

Prerequisites

You have purchased a database audit instance and the **Status** is **Running**.

Procedure

- Step 1 Log in to the management console.
- Step 2 Select a region, click —, and choose Security & Compliance > Database Security Service. The Dashboard page is displayed.
- **Step 3** In the navigation tree on the left, choose **Instances**.
- **Step 4** Click the name of the instance whose operation logs you want to view. The **Overview** page is displayed.
- **Step 5** Click the **Logs** tab. The log list page is displayed.
- **Step 6** View operation logs, as shown in **Figure 10-13**. For details about related parameters, see **Table 10-10**.

Figure 10-13 Viewing operation logs



□ NOTE

Select Last 30 minutes, 1 hour, 24 hours, 7 days, or 30 days, or click to set start time and end time to view the operation logs of a specified time range.

Table 10-10 Parameters

Parameter	Description		
Username	User who performs the operation		
Time	Time when the operation was performed		
Function	Function of the operation		
Action	Action of the operation		
Operation Object	Object of the operation		
Description	Description of the operation		
Result	Result of the operation		

----End

1 1 Key Operations Recorded by CTS

11.1 Viewing Tracing Logs

After you enable CTS, the system starts recording operations on DBSS. Operation records for the last seven days can be viewed on the CTS console.

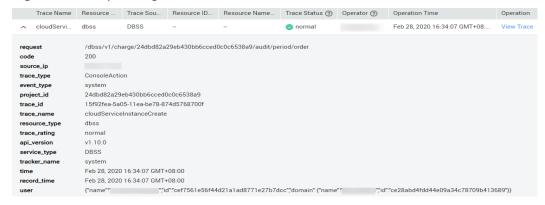
Viewing a DBSS Trace on the CTS Console

- **Step 1** Log in to the management console.
- Step 2 In the navigation pane on the left, click and choose Management & Governance > Cloud Trace Service.
- **Step 3** Choose **Trace List** in the navigation pane.
- **Step 4** Click **Region** at the top of the **Trace List** page to set the corresponding conditions.

The following four filters are available:

- Trace Type, Trace Source, Resource Type, and Search By
 - Select the filter from the drop-down list. Set Trace Source to DBSS.
 - When you select **Trace name** for **Search By**, you also need to select a specific trace name.
 - When you select Resource ID for Search By, you also need to select or enter a specific resource ID.
 - When you select **Resource name** for **Search By**, you also need to select or enter a specific resource name.
- **Operator**: Select a specific operator (a user other than tenant).
- Trace Rating: Available options include All trace status, normal, warning, and incident. You can only select one of them.
- In the upper right corner of the page, you can query traces in the last 1 hour, last 1 day, last 1 week, or within a customized period.
- Step 5 Click Query.
- **Step 6** Click ✓ on the left of a trace to expand its details.

Figure 11-1 Expanding trace details



Step 7 Click **View Trace** in the **Operation** column. On the displayed **View Trace** dialog box shown in **Figure 11-2**, the trace structure details are displayed.

Figure 11-2 Viewing a trace

```
View Trace
         "project_id": "24dbd82a29eb430bb6cced0c0c6538a9",
             "request": "/dbss/v1/charge/24dbd82a29eb430bb6cced0c0c6538a9/audit/period/order",
            "code": "200",
"source_ip": "
             "trace_type": "ConsoleAction",
             "event_type": "system",
"project_id": "24dbd82a29eb430bb6cced0c0c6538a9",
             "trace_id": "15f92fea-5a05-11ea-be78-874d5768700f",
             "trace name": "cloudServiceInstanceCreate",
             "resource_type": "dbss",
             "trace_rating": "normal",
"api_version": "v1.10.0",
             "service_type": "DBSS",
             "tracker_name": "system",
             "time": "1582878847751",
             "record time": "1582878847821",
             "id": "cef7561e56f44d21a1ad8771e27b7dcc",
                 "domain": {
    "name": "_____",
                     "id": "ce28abd4fdd44e09a34c78709b413689"
```

----End

11.2 Auditable Operations

Cloud Trace Service (CTS) records all cloud service operations on DBSS, including requests initiated from the management console or open APIs and responses to the requests, for tenants to query, audit, and trace.

Close

Table 11-1 lists DBSS operations recorded by CTS.

Table 11-1 DBSS operations that can be recorded by CTS

Operation	Resource Type	Trace Name
Creating an instance	dbss	createInstance
Deleting an instance	dbss	deleteInstance
Starting an instance	dbss	startInstance
Stopping an instance	dbss	stopInstance
Restarting an instance	dbss	rebootInstance
Changing the instance status	dbss	cloudServiceInstanceStatus
Creating a yearly/monthly instance	dbss	cloudServiceInstanceCreate
Changing the instance metadata	dbss	updateMetaData

12 Monitoring

12.1 DBSS Monitored Metrics

Description

This section describes monitored metrics reported by DBSS to Cloud Eye as well as their namespaces and dimensions. You can use console or APIs provided by Cloud Eye to query the metrics of the monitored objects and alarms generated for DBSS.

Namespace

SYS.DBSS

□ NOTE

A namespace is an abstract collection of resources and objects. Multiple namespaces can be created in a single cluster with the data isolated from each other. This enables namespaces to share the same cluster services without affecting each other.

Metrics

Table 12-1 DBSS metrics

Metri c ID	Metri c Name	Description	Value Range	Monitored Object	Monitori ng Interval (Raw Data)
cpu_u til	CPU Usage	CPU consumed by the monitored object Unit: % Collection method: 100% minus idle CPU usage percentage	0 to 100% Value type: Float	Database audit instance	1 minute
mem_ util	Memo ry Usage	Memory usage of the monitored object Unit: % Collection method: 100% minus idle memory percentage	0 to 100% Value type: Float	Database audit instance	1 minute
disk_u til	Disk usage	Disk usage of the monitored object Unit: % Collection method: 100% minus idle disk space percentage	0 to 100% Value type: Float	Database audit instance	1 minute

12.2 Configuring Alarm Monitoring Rules

You can set DBSS alarm rules to customize the monitored objects and notification policies, and set parameters such as the alarm rule name, monitored object, metric, threshold, monitoring scope, and whether to send notifications. This helps you learn the database security status in a timely manner.

Prerequisites

You have purchased a DBSS instance.

Procedure

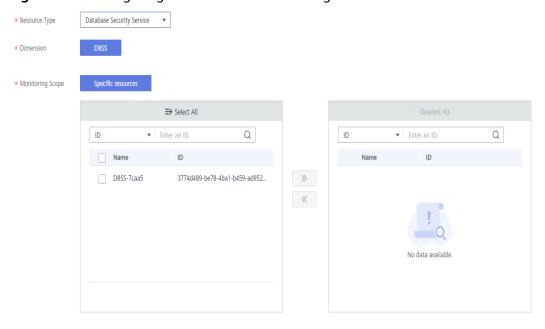
- Step 1 Log in to the management console.
- Step 2 Click in the upper left corner of the page and choose Management & Governance > Cloud Eye.

- **Step 3** In the navigation pane on the left, choose **Alarm Management > Alarm Rules**.
- **Step 4** In the upper right corner of the page, click **Create Alarm Rule**.
- **Step 5** Set the alarm rule name and select an enterprise project to which the alarm rule belongs.



Step 6 Select **Database Security Service** from the **Resource Type** drop-down list, and select a dimension, monitoring scope, alarm template, and whether to send a notification. **Figure 12-1** shows an example.

Figure 12-1 Configuring a DBSS alarm monitoring rule



Step 7 Click **Create**. In the displayed dialog box, click **OK**.

----End

12.3 Viewing Monitoring Metrics

You can view DBSS metrics on the management console to learn about the database security status in a timely manner and configure protection policies based on the metrics.

Prerequisites

DBSS alarm rules have been configured in Cloud Eye. For more details, see **Configuring Alarm Monitoring Rules**.

Procedures

- Step 1 Log in to the management console.
- Step 2 Click in the upper left corner of the page and choose Management & Governance > Cloud Eye.
- **Step 3** In the navigation pane on the left, choose **Cloud Service Monitoring > Database Security Service**.
- **Step 4** In the row containing the dedicated DBSS instance, click **View Metric** in the **Operation** column.

----End

13 Permission Control

13.1 Creating a User and Granting Permissions

You can use **IAM** to implement refined permission control for DBSS resources. To be specific, you can:

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

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

This section describes the procedure for granting permissions (see Figure 13-1).

Prerequisites

Before authorizing permissions to a user group, you need to know which DBSS permissions can be added to the user group. **Table 13-1** describes the policy details. For details about system permissions supported by DBSS, see **DBSS Permissions**.

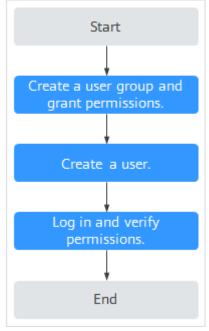
Table 13-1 System permissions

Role/Policy Name	Description	Туре	Dependency
DBSS Audit Administrato r	DBSS audit administrator, who has the permissions to check DBSS security logs.	System- defined role	None

Role/Policy Name	Description	Туре	Dependency
DBSS FullAccess	Full permissions for DBSS	System- defined policy	
DBSS ReadOnlyAcc ess	Read-only permissions for DBSS. Users granted these permissions can only view this service and cannot configure resources in it.	System- defined policy	

Process Flow

Figure 13-1 Process for granting permissions



1. Create a user group and assign permissions.

Create a user group on the IAM console and grant the user group the **DBSS Security Administrator** permission for DBSS.

2. Create a user and add it to a user group.

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

3. Log in and verify permissions.

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

Example verification method: Try starting or stopping an instance. If a message indicating Insufficient permissions are displayed, the **DBSS Security Administrator** role has taken effect.

13.2 DBSS Custom Policies

Custom policies can be created to supplement the system-defined policies of DBSS. For the actions supported for custom policies, see **DBSS Permissions and Supported Actions**.

Examples of Custom Policies

• Example 1: Allowing a user to query the database audit list

• Example 2: Denying database audit instance deletion

A deny policy must be used together with other policies. If the policies assigned to a user contain both Allow and Deny actions, the Deny actions take precedence over the Allow actions.

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

• Example 3: Defining permissions for multiple services in a policy

A custom policy can contain the actions of multiple services that are of the global or project-level type. The following is an example policy containing actions of multiple services:

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
```

```
"dbss:defendInstance:eipOperate",
    "dbss:auditInstance:getSpecification"

]
},
{
    "Effect": "Allow",
    "Action": [
        "hss:accountCracks:unblock",
        "hss:commonIPs:set"
    ]
}
```

13.3 DBSS Permissions and Supported Actions

This section describes fine-grained permissions management for your DBSS resources. If your Huawei Cloud account does not need individual IAM users, you can skip this section.

By default, new IAM users do not have any permissions. You need to add a user 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. Users inherit permissions from the groups and can perform operations on cloud services as allowed by the permissions.

Supported Actions

DBSS 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. Operations supported by policies are specific to APIs. The following are common concepts related to policies:

- Permissions: Statements in a policy that allow or deny certain operations.
- Actions: Specific operations that are allowed or denied.
- Related actions: Actions on which a specific action depends to take effect.
 When assigning permissions for the action to a user, you also need to assign permissions for the related actions.

Table 13-2 lists the API actions supported by DBSS.

Table	13-2	Actions
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Permission	Action
Query the list of database audit instances	dbss:auditInstance:list
Obtain available specifications of database audit instances	dbss:auditInstance:getSpecification
View database protection instance details	dbss:defendInstance:list
Delete a database audit instance	dbss:auditInstance:delete

Permission	Action
Purchase database protection instances on demand	dbss:defendInstance:createOnDemand
Purchase database audit instances on demand	dbss:auditInstance:createOnDemand
Purchase database audit instances on demand	dbss:auditInstance:createOnOrder
Restart a database protection instance	dbss:defendInstance:reboot
Start a database audit instance	dbss:auditInstance:start
Stop a database audit instance	dbss:auditInstance:stop
Restart a database audit instance	dbss:auditInstance:reboot
Start a database protection instance	dbss:defendInstance:start
Stop a database protection instance	dbss:defendInstance:stop

14 How Long Is the Database Audit Data Stored by Default?

Database audit can store online and archived audit data for at least 180 days. If the backup function is disabled and disk space is sufficient, logs are stored on the audit instance for 180 days by default. If a large number of new audit logs need to be stored, the system automatically deletes the old logs on a rolling basis to ensure sufficient disk space. If the backup function is enabled, logs and backup logs will also be stored in OBS for same duration.

However, the storage duration also depends on the disk capacity of the log database. To store your audit data long enough, you are advised to:

- Choose a database audit edition suitable for your business.
 - To audit a small volume of data, purchase the basic edition.
 - To audit a large volume of data, purchase the professional or advanced edition.

For more information, see Table 14-1.

• Back up audit logs.

For details, see **Backing Up and Restoring Database Audit Logs**.

Table 14-1 Database audit editions

Versio	Maximum	System	Performance
n	Databases	Resource	
Profess ional	6	 CPU: 8 vCPUs Memory: 32 GB Hard disk: 1000 GB 	 Peak QPS: 6,000 queries/second Database load rate: 7.2 million statements/hour Stores 600 million online SQL statements. Stores 10 billion archived SQL statements.

Versio n	Maximum Databases	System Resource	Performance
Advanc ed	30	• CPU: 16 vCPUs	Peak QPS: 30,000 queries/ second
		• Memory: 64 GB	Database load rate: 10.80 million statements/hour
		Hard disk: 2000 GB	Stores 1.5 billion online SQL statements.
			Stores 60 billion archived SQL statements.

- A database instance is uniquely defined by its database IP address and port.
 The number of database instances equals the number of database ports. If a database IP address has N database ports, there are N database instances.
 - Example: A user has two database IP addresses, IP_1 and IP_2 . IP_1 has a database port. IP_2 has three database ports. IP_1 and IP_2 have four database instances in total. To audit all of them, select professional edition DBSS, which supports a maximum of six database instances.
- To change the edition of a DBSS instance, unsubscribe from it and purchase a new one.
- The table above lists the system resources consumed by a database audit instance.
 Ensure your system has the required configurations before purchasing database audit instances.
- Online SQL statements are counted based on the assumption that the capacity of an SQL statement is 1 KB.

15 On What Windows Versions Can I Install the Agent?

To use database audit, you need to install its agent on database nodes or application nodes.

The agent can be installed on the following Windows versions:

- Windows Server 2008 R2 (64bit)
- Windows Server 2012 R2 (64bit)
- Windows Server 2016 (64bit)
- Windows Server 2019 (64bit)
- Windows 7 (64bit)
- Windows 10 (64bit)

□ NOTE

The DBSS agent depends on Npcap. If the message "Npcap not found, please install Npcap first" is displayed when you install the DBSS agent, first install Npcap and then the DBSS agent.

Npcap download link: https://npcap.com/#download

Figure 15-1 Npcap not found

A Change History

Released On	Description
2023-06-30	This is the thirty-third official release. Added: Viewing Trend Analysis Upgrading the Database Audit Instance Version
2022-11-30	This is the thirty-second official release. Added Overview.
2022-11-16	This is the thirty-first official release. Added the description of automatic backup delay.
2022-06-08	This is the thirtieth official release. Added the description about interconnecting DBSS with CES. Added the following sections: • DBSS Monitored Metrics • Configuring Alarm Monitoring Rules • Viewing Monitoring Metrics
2022-03-24	This is the twenty-ninth official release. The function of manually backing up audit logs is brought offline. • Purchasing Database Audit: Added the Enterprise Project parameter. • Backing Up and Restoring Database Audit Logs: Added the OBS fine-grained authorization operation. Users can configure daily or hourly backup.
2022-01-07	This is the twenty-eighth official release. Table 2-7 : Added the description that when Type is set to MySQL , the database list is automatically displayed for users to choose from.

Released On	Description
2021-08-30	This is the twenty-seventh official release. Changed the menu item Security to Security & Compliance on the console.
	Added the following content:
	Adding an SQL Injection Rule: Added section "Adding an SQL Injection Rule".
	 Adding a Database: Added the description that if users select GaussDB(for MySQL), a list of database instances will be displayed.
	 Adding an Agent (Self-built Databases on ECS/BMS): Added the description about the threshold configuration function when an agent is added to the database.
	Procedure: The Agent exceptions filtering option is added to alarm information.
2021-04-19	This is the twenty-sixth official release.
	 Changed the name of the agent installation package in Installing an Agent (Linux OS).
	 Added the SHA256 verification value used for the agent package integrity check in Managing Databases and Agents.
	 Changed the name of the agent installation package in Uninstalling an Agent.
2021-03-22	This is the twenty-fifth official release.
	 Optimized descriptions in Step 2: Add an Agent.
	Optimized descriptions in Adding Risky Operations.
2021-01-19	This is the twenty-fourth official release.
	Optimized the database audit process.
2020-12-18	This is the twenty-third official release.
	Added Step 4: Add a Security Group Rule.
	 Added the description about setting a security group rule in Process Overview.
	 Optimized descriptions in Step 2: Add an Agent.
	 Optimized descriptions in Step 3: Download and Install the Agent.
	Added prerequisites in Viewing Audit Results.

Released On	Description
2020-12-15	This is the twenty-second official release. Optimized descriptions in Step 1: Add a Database.
2020-11-27	This is the twenty-first release. Added Exception IP Address to audit scope settings in Adding Audit Scope.
2020-10-14	This is the twentieth official release. Added the description about selecting a VPC during database audit purchasing in Purchasing Database Audit.
2020-09-23	This is the nineteenth official release. Added the default database reduction detection rule for auditing risky operations in Adding Risky Operations.
2020-09-01	 This is the eighteenth official release. Added the restriction on the length of audit statements and result sets in Viewing SQL Statement Details. Optimized descriptions in Creating a User and Granting Permissions.
2020-07-31	 This is the seventeenth official release. Added description about alarm notification changes, interconnection with SMN, and notification modes in Configuring Alarm Notifications. Deleted section "Configuring Email Notification".
2020-07-08	 This is the sixteenth official release. Optimized descriptions in Installing an Agent (Linux OS). Optimized descriptions in Installing an Agent (Windows OS).
2020-06-29	This is the fifteenth official release. Optimized descriptions in Purchasing Database Audit.
2020-06-18	 This is the fourteenth official release. Optimized descriptions in Adding Audit Scope. Optimized descriptions in Configuring Alarm Notifications.

Released On	Description
2020-06-05	 This is the thirteenth official release. Added the scope of audited operation types in Adding Audit Scope. Added the alarm type Log backup to OBS failed in Viewing the Alarms.
2020-05-20	This is the twelfth official release. Optimized descriptions in Purchasing Database Audit.
2020-05-06	 This is the eleventh official release. Optimized descriptions in Step 2: Add an Agent. Optimized descriptions in Downloading an Agent.
2020-04-10	This is the tenth official release. Updated some screenshots.
2020-03-20	This is the ninth official release. Added instance status in Managing Database Audit Instances.
2020-03-16	 This is the eighth official release. Added the GBK character set, and added the 19c version for Oracle databases. Changed "Troubleshooting for Database Protection" to FAQs. Changed "Troubleshooting for Database Audit" to FAQs.
2020-03-03	 This is the seventh official release. Added the description about instance creation failures in Purchasing Database Audit. Optimized descriptions in Step 1: Add a Database. Optimized descriptions in Managing Database Audit Instances.
2020-02-21	This is the sixth official release. Added the description about database audit for Windows OS.
2020-01-21	 This is the fifth official release. Optimized descriptions in Configuring Alarm Notifications. Optimized descriptions in Backing Up and Restoring Database Audit Logs.

Released On	Description
2019-12-23	This is the fourth official release. Added descriptions about IPv6.
2019-12-03	 This is the third official release. Added the description about database audit. Deleted the content about database protection.
2019-01-15	This is the second official release. Revised the document outline and optimized the content description.
2018-05-31	This is the first official release.