# **Key-Value Storage Service**

# **User Guide**

Issue 01

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# 1 Applying for a Beta Test

KVS is now open for a beta test. Do the following to apply:

# **Procedure**

- **Step 1** Log in to the console.
- **Step 2** Click **Service List** and choose **Storage** > **Key-Value Storage Service**.
- Step 3 Click Apply for OBT.
- **Step 4** Specify information including the enterprise scale, proportion of R&D engineers, application scenario, current service phase, and service description.
- Step 5 Select I have read and agree to the OBT Trial Use Agreement and click Apply Now.

### ----End

The review results will be sent to your email and mobile phone within five workdays.

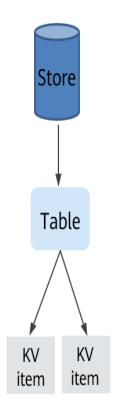
**2** Stores

# 2.1 Store Overview

A store is where you store and query data in KVS. You can create different stores based on the division of your business.

The storage structure of KVS consists of three layers. From the top down, they are the store layer, the table layer, and the KV item layer. Each store contains one or more tables, and each table contains one or more KV items. Suppose you want to store data about all employees in a department. You can create a store for this department and create a table in that store to store employee information.

Figure 2-1 Store structure



You can create and query a store as well as query store details.

**Table 2-1** Store features supported on the console

Feature	Description	
Creating a Store	Create a store and create a table and indexes.	
Querying Stores	View the store list.	
<b>Querying Store Details</b>	View store details.	

# 2.2 Creating a Store

# **Scenarios**

You will create a store, a table, and indexes on the KVS console.

# **Notes and Constraints**

A store name must be 16 to 52 characters long. It can only include numbers (0-9), letters (a-z, A-Z), and hyphens (-), and it cannot start or end with a hyphen (-). It must be globally unique across tenants. A store name must be in the format of {user-defined-prefix}-{selected-region-name-on-the-console}-{account-ID}, for example, exampleprefix-cn-north-4-exampledomainid.

- Store names are case-insensitive. If you have a store named, for example, exampleprefix-cn-north-4-exampledomainid, you cannot create a new one named, for example, Exampleprefix-cn-north-4-exampledomainid because KVS will take them as the same one, leading to the creation failure.
- Each account can create up to 25 stores.

### **Procedure**

- **Step 1** Log in to the KVS console.
- **Step 2** In the navigation pane, choose **Stores**.
- **Step 3** In the upper right corner of the page, click **Create Store**.
- **Step 4** In the **Store Details** area, configure parameters as instructed in **Table 2-2**.

Figure 2-2 Store Details page



**Table 2-2** Store parameters

Туре	Parameter	Description
Store Details	Store Name	Mandatory The name of a store. A store name must be 16 to 52 characters long. It only accepts numbers (0–9), letters (a–z, A–Z), and hyphens (-) and cannot start or end with a hyphen (-). It must be globally unique across tenants.
		A store name must be in the format of <i>{user-defined-prefix}-{selected-region-name-on-the-console}-{account-ID}.</i> NOTICE
		You only need to specify a prefix. {selected-region- name-on-the-console} and {account-ID} are automatically specified.

**Step 5** In the **Basic Configuration** area, select a billing mode. For details about the billing modes, see **Table 2-3**.

Figure 2-3 Basic Configuration page

# Basic Configuration Billing Mode Pay-per-use Provisioned

Choose this mode if your service traffic is unpredictable or fluctuates a lot.

Table 2-3 Basic configuration parameters

Туре	Parameter	Description
Basic Configuration	Pay-per-Use	Post payment. Choose this mode if your service traffic is unpredictable or fluctuates a lot.
	Provisioned	Post payment. Choose this mode if your service traffic is stable or predictable.

# **Step 6** Configure table parameters as instructed in **Table 2-4**.

Figure 2-4 Table Details page

# Name Enter a table name. The table name must be unique in the store. Shard Key Enter a shard key name. Sort Key Enter a sort key name.

Table 2-4 Table parameters

Туре	Parameter	Description
Table	Name	Mandatory
Details		The name of a table. A table name must be 3 to 52 characters long and must be unique storewide. Numbers (0–9), letters (a–z and A–Z), hyphens (-), and underscores (_) are allowed.
	Shard Key	Mandatory
		A shard key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0–9), letters (a–z and A–Z), hyphens (-), and underscores (_) are allowed.
	Sort Key	Optional
		A sort key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0–9), letters (a–z and A–Z), hyphens (-), and underscores (_) are allowed.

**Step 7** (Optional) This step is only required for the provisioned billing mode. In the **Provisioned Throughput** area, configure parameters shown in **Table 2-5**.

The provisioned read/write throughput of a table is determined by the average KV item size, the number of KV items read/written per second, average size of local secondary index items, and the number of local secondary index items read/written per second.

You can use the calculator to estimate the read and write throughputs by clicking **Throughput Calculator** and configure parameters shown in **Figure 2-6**. For details about the parameters, see **Table 2-6**. After the parameters are configured, click **OK**. The calculated values are automatically synchronized to **Read Throughput** and **Write Throughput** as shown in **Figure 2-5**.

Figure 2-5 Provisioned Throughput page



Figure 2-6 Throughput Calculator page

# X Throughput Calculator Average KV Item Size KΒ KV Items Read per Second KV Items Written per Second Average Size of Local Secondary Index Items KΒ Local Secondary Index Items Read per Second Local Secondary Index Items Written per Second Read Throughput 0 RCU Read throughput = ROUNDUP(Average KV item size in KB/4) × KV items read per second + ROUNDUP(Average size of local secondary index items in KB/4) × Local secondary index items read per second Write Throughput 0 WCU Write throughput = ROUNDUP(Average KV item size in KB) × KV items written per second + ROUNDUP(Average size of local secondary index items in KB) × Local secondary index items written per second OK Cancel

**Table 2-5** Provisioned throughput parameters

Туре	Parameter	Description
Provisioned Throughput	Read Throughput	<ul> <li>Value range: 1 to 50000 (unit: RCU)</li> <li>NOTE         <ul> <li>Up to 100,000 RCUs can be provisioned for each user in a region.</li> </ul> </li> <li>Read throughput = ROUNDUP(Average KV item size in KB/4) × KV items read per second + ROUNDUP(Average size of local secondary index items in KB/4) × Local secondary index items read per second</li> </ul>
	Write Throughput	<ul> <li>Value range: 1 to 50000 (unit: WCU)</li> <li>NOTE         <ul> <li>Up to 100,000 WCUs can be provisioned for each user in a region.</li> </ul> </li> <li>Write throughput = ROUNDUP(Average KV item size in KB) × KV items written per second + ROUNDUP(Average size of local secondary index items in KB) × Local secondary index items written per second</li> </ul>

**Table 2-6** Throughput Calculator parameters

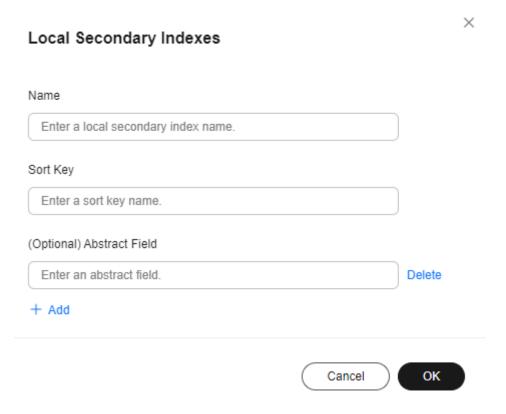
Parameter	Example Value	Description
Average KV Item Size	100	Required
		Enter the provisioned average KV size, in KB.
KV Items Read per	10	Required
Second		Enter the number of KV items to be read per second.
KV Items Written per Second	10	<ul><li>Required</li><li>Enter the number of KV items to be written per second.</li></ul>
Average Size of Local Secondary Index Items	100	<ul> <li>Required</li> <li>Enter the provisioned average size of local secondary index items, in KB.</li> </ul>

Parameter	Example Value	Description
Local Secondary Index Items Read per Second	10	<ul> <li>Required</li> <li>Enter the number of local secondary index items to be read per second.</li> </ul>
Local Secondary Index Items Written per Second	10	<ul> <li>Required</li> <li>Enter the number of local secondary index items to be written per second.</li> </ul>
Read Throughput	500	<ul> <li>The value is automatically calculated. The unit is RCU.</li> <li>Read throughput =         ROUNDUP(Average KV item size in KB/4) × KV items read per second +         ROUNDUP(Average size of local secondary index items in KB/4) × Local secondary index items read per second</li> </ul>
Write Throughput	2000	<ul> <li>The value is automatically calculated. The unit is WCU.</li> <li>Write throughput =         ROUNDUP(Average KV item size in KB) × KV items written per second +         ROUNDUP(Average size of local secondary index items in KB) × Local secondary index items written per second</li> </ul>

**Step 8** In the **Secondary Index** area, create secondary indexes. KVS allows you to create local and global secondary indexes.

1. Click **Create Local Secondary Index** and configure parameters as instructed in **Table 2-7**. Confirm the configuration and click **OK**.

Figure 2-7 Local Secondary Indexes

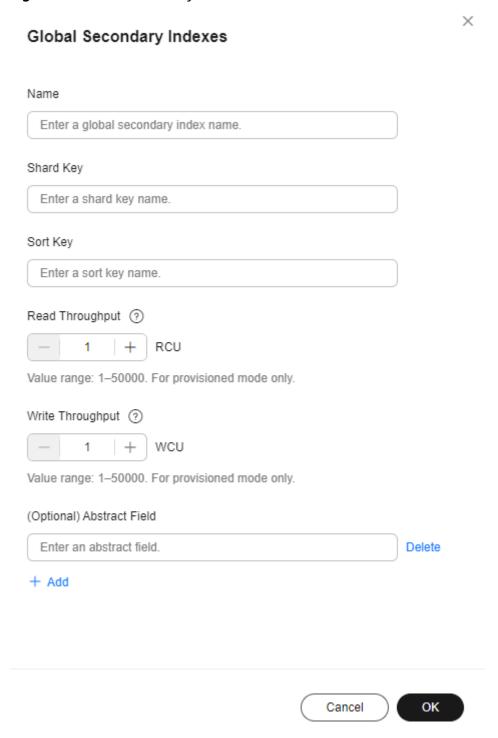


**Table 2-7** Local secondary index parameters

Туре	Parameter	Description
Create Local Secondary Index	Name	Mandatory The name of a local secondary index. It must be 1 to 255 characters long. Numbers (0–9), letters (a–z and A–Z), hyphens (-), underscores (_), and periods (.) are allowed. An index name cannot be <b>XPriIndex</b> .
	Sort Key	Mandatory A sort key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Abstract Field	Optional  An abstract field in the local secondary index. You can create multiple abstract fields in an index. An abstract field must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.

2. Click **Create Global Secondary Index** and configure parameters as instructed in **Table 2-8**. Confirm the configuration and click **OK**.

Figure 2-8 Global Secondary Indexes



**Table 2-8** Global secondary index parameters

Туре	Parameter	Description
Create	Name	Mandatory
Global Secondary Index		The name of a global secondary index. It must be 1 to 255 characters long. Numbers (0–9), letters (a–z and A–Z), hyphens (-), underscores (_), and periods (.) are allowed. An index name cannot be <b>XPriIndex</b> .
	Shard Key	Mandatory
		A shard key must be 1 to 63 characters long and cannot start with an underscore (_).  Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Sort Key	Optional
		A sort key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Read Throughput	Value range: 1 to 50000 (unit: RCU) This field is only valid in the provisioned billing mode.
	Write Throughput	Value range: 1 to 50000 (unit: WCU) This field is only valid in the provisioned billing mode.
	Abstract Field	Optional
		An abstract field in the global secondary index. You can create multiple abstract fields in an index. An abstract field must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.

Step 9 Confirm the settings and click OK.

# 2.3 Querying Stores

# **Scenarios**

You will query stores.

# **Procedure**

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

- **Step 2** In the navigation pane, choose **Stores**.
- Step 3 In the search box of the displayed page, enter a keyword of the required store or select Store Name from the Property list and then select a store from the drop-down list. To create a table for this store, click Create Table in the Operation column.

Figure 2-9 A store list



**□** NOTE

Stores cannot be deleted.

----End

# 2.4 Querying Store Details

# **Scenarios**

You will check the details about a store, including its name and the tables it contains.

# **Prerequisites**

The store you want to query has been created.

### **Procedure**

- **Step 1** Log in to the KVS console.
- **Step 2** In the navigation pane, choose **Stores**.
- **Step 3** Click the required store name. The store details page is displayed.

**Figure 2-10** Store details page



**Step 4** Check the store name and table details.

----End

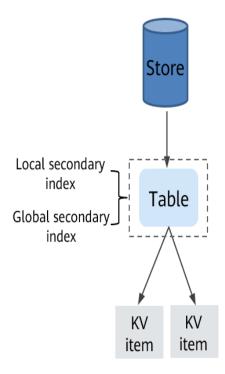
# $\mathbf{3}_{\mathsf{Tables}}$

# 3.1 Table Overview

A table is a collection of KV items and belongs to a store.

You can create one or more tables in a store to store KV data. Suppose you have a store for storing the information about all employees in your company. You can create separate tables to record employee information for each department.

Figure 3-1 Table overview



You can create and delete a table, query tables, and query table details.

Table 3-1 Table features

Feature	Description
Creating a Table	Create a table in a store and create indexes for it.
Querying Tables	Query tables in a store.
Querying Table Details	Query details about a table.

# 3.2 Creating a Table

### **Scenarios**

You will create a table in a store and create indexes for it.

# **Prerequisites**

The store where you want to create a table has been created.

## **Notes and Constraints**

- Up to 100 tables can be created in a store.
- A table must belong to a store.
- You can only define one shard key and one sort key for a single table.
- A table name must be 3 to 52 characters long and unique store-wide. Numbers (0–9), letters (a–z and A–Z), hyphens (-), and underscores (\_) are allowed.
- Table names are case-sensitive. Suppose you have a table named exampletable in a store. You can create another table named ExampleTable in the store successfully.

### **Procedure**

- **Step 1** Log in to the KVS console.
- **Step 2** In the navigation pane, choose **Stores**.
- **Step 3** Search for and select a store where you want to create a table and click **Create Table** in the **Operation** column. Or click the store name to go to its details page and click **Create Table**.
- **Step 4** In the **Basic Configuration** area, select a billing mode. For details about the billing modes, see **Table 3-2**.

Figure 3-2 Basic Configuration page

# Basic Configuration Billing Mode Pay-per-use Provisioned

Choose this mode if your service traffic is unpredictable or fluctuates a lot.

Table 3-2 Basic configuration parameters

Туре	Parameter	Description
Basic Configuration	Pay-per-Use	Post payment. Choose this mode if your service traffic is unpredictable or fluctuates a lot.
	Provisioned	Post payment. Choose this mode if your service traffic is stable or predictable.

# **Step 5** Configure table parameters as instructed.

Figure 3-3 Table Details page

# Name Enter a table name. The table name must be unique in the store. Shard Key Enter a shard key name. Sort Key Enter a sort key name.

**Table 3-3** Table parameters

Туре	Parameter	Description
Table Details	Name	Mandatory
		The name of a table. A table name must be 3 to 52 characters long and unique store-wide.  Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Shard Key	Mandatory
		A shard key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Sort Key	Optional
		A sort key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.

**Step 6** (Optional) This step is only required for the provisioned billing mode. In the **Provisioned Throughput** area, configure parameters shown in **Table 3-4**.

The provisioned read/write throughput of a table is determined by the average KV item size, the number of KV items read/written per second, average size of local secondary index items, and the number of local secondary index items read/written per second.

You can use the calculator to estimate the read and write throughputs by clicking **Throughput Calculator** and configure parameters shown in **Figure 3-5**. For details about the parameters, see **Table 3-5**. After the parameters are configured, click **OK**. The calculated values are automatically synchronized to **Read Throughput** and **Write Throughput** as shown in **Figure 3-4**.

Figure 3-4 Provisioned Throughput page



Figure 3-5 Throughput Calculator page

# X Throughput Calculator Average KV Item Size KΒ KV Items Read per Second KV Items Written per Second Average Size of Local Secondary Index Items KΒ Local Secondary Index Items Read per Second Local Secondary Index Items Written per Second Read Throughput 0 RCU Read throughput = ROUNDUP(Average KV item size in KB/4) × KV items read per second + ROUNDUP(Average size of local secondary index items in KB/4) × Local secondary index items read per second Write Throughput 0 WCU Write throughput = ROUNDUP(Average KV item size in KB) × KV items written per second + ROUNDUP(Average size of local secondary index items in KB) × Local secondary index items written per second OK Cancel

**Table 3-4** Provisioned throughput parameters

Туре	Parameter	Description
Provisioned Throughput	Read Throughput	<ul> <li>Value range: 1 to 50000 (unit: RCU)</li> <li>NOTE         <ul> <li>Up to 100,000 RCUs can be provisioned for each user in a region.</li> </ul> </li> <li>Read throughput = ROUNDUP(Average KV item size in KB/4) × KV items read per second + ROUNDUP(Average size of local secondary index items in KB/4) × Local secondary index items read per second</li> </ul>
	Write Throughput	<ul> <li>Value range: 1 to 50000 (unit: WCU)</li> <li>NOTE         <ul> <li>Up to 100,000 WCUs can be provisioned for each user in a region.</li> </ul> </li> <li>Write throughput = ROUNDUP(Average KV item size in KB) × KV items written per second + ROUNDUP(Average size of local secondary index items in KB) × Local secondary index items written per second</li> </ul>

**Table 3-5** Throughput Calculator parameters

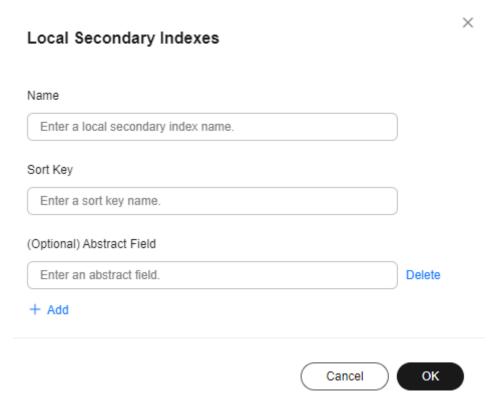
Parameter	Example Value	Description
Average KV Item Size	100	Required
		Enter the provisioned average KV size, in KB.
KV Items Read per	10	Required
Second		Enter the number of KV items to be read per second.
KV Items Written per Second	10	<ul><li>Required</li><li>Enter the number of KV items to be written per second.</li></ul>
Average Size of Local Secondary Index Items	100	<ul> <li>Required</li> <li>Enter the provisioned average size of local secondary index items, in KB.</li> </ul>

Parameter	Example Value	Description
Local Secondary Index Items Read per Second	10	<ul> <li>Required</li> <li>Enter the number of local secondary index items to be read per second.</li> </ul>
Local Secondary Index Items Written per Second	10	<ul> <li>Required</li> <li>Enter the number of local secondary index items to be written per second.</li> </ul>
Read Throughput	500	<ul> <li>The value is automatically calculated. The unit is RCU.</li> <li>Read throughput =         ROUNDUP(Average KV item size in KB/4) × KV items read per second +         ROUNDUP(Average size of local secondary index items in KB/4) × Local secondary index items read per second</li> </ul>
Write Throughput	2000	<ul> <li>The value is automatically calculated. The unit is WCU.</li> <li>Write throughput =         ROUNDUP(Average KV item size in KB) × KV items written per second +         ROUNDUP(Average size of local secondary index items in KB) × Local secondary index items written per second</li> </ul>

**Step 7** In the **Secondary Index** area, create secondary indexes. KVS allows you to create local and global secondary indexes.

1. Click **Create Local Secondary Index** and configure parameters as instructed in **Table 3-6**. Confirm the configuration and click **OK**.

Figure 3-6 Local Secondary Indexes

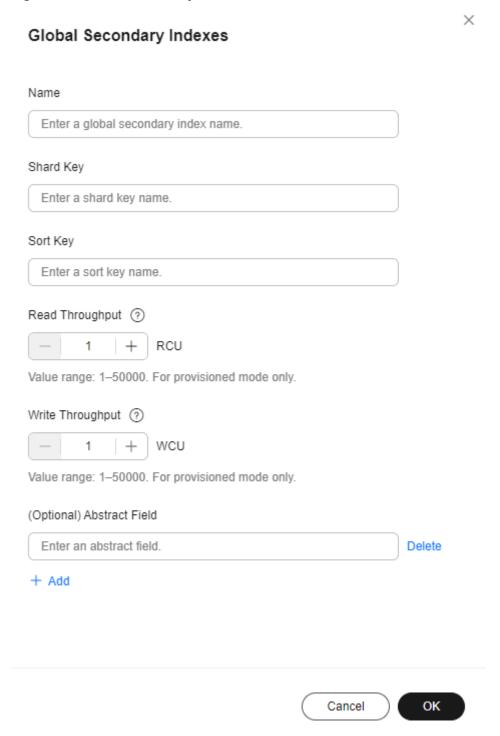


**Table 3-6** Local secondary index parameters

Туре	Parameter	Description
Create Local Secondary Index	Name	Mandatory The name of a local secondary index. It must be 1 to 255 characters long. Numbers (0–9), letters (a–z and A–Z), hyphens (-), underscores (_), and periods (.) are allowed. An index name cannot be <b>XPriIndex</b> .
	Sort Key	Mandatory A sort key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Abstract Field	Optional  An abstract field in the local secondary index. You can create multiple abstract fields in an index. An abstract field must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.

2. Click **Create Global Secondary Index** and configure parameters as instructed in **Table 3-7**. Confirm the configuration and click **OK**.

Figure 3-7 Global Secondary Indexes



**Table 3-7** Global secondary index parameters

Туре	Parameter	Description
Create Global Secondary Index	Name	Mandatory The name of a global secondary index. It must be 1 to 255 characters long. Numbers (0–9), letters (a–z and A–Z), hyphens (-), underscores (_), and periods (.) are allowed. An index name cannot be <b>XPriIndex</b> .
	Shard Key	Mandatory A shard key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Sort Key	Optional  A sort key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Read Throughput	Value range: 1 to 50000 (unit: RCU) This field is only valid in the provisioned billing mode.
	Write Throughput	Value range: 1 to 50000 (unit: WCU) This field is only valid in the provisioned billing mode.
	Abstract Field	Optional
		An abstract field in the global secondary index. You can create multiple abstract fields in an index. An abstract field must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.

**Step 8** Confirm the configuration and click **OK**.

# 3.3 Querying Tables

# **Scenarios**

You will query tables in a store.

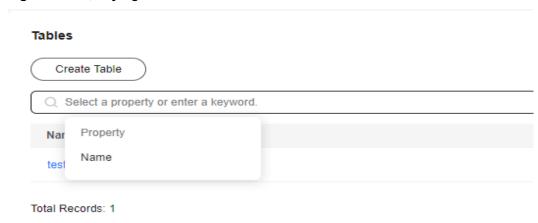
# **Prerequisites**

The table you want to query has been created.

# **Procedure**

- **Step 1** Log in to the KVS console.
- **Step 2** In the navigation pane, choose **Stores**.
- **Step 3** Search for and select a store. The store details page is displayed.
- **Step 4** In the **Tables** area, enter a keyword of the required table or select **Name** from the **Property** list and then select a table from the drop-down list.

Figure 3-8 Querying tables



----End

# 3.4 Querying Table Details

# **Scenarios**

You will check details about a table, including its overview, indexes, and KV items.

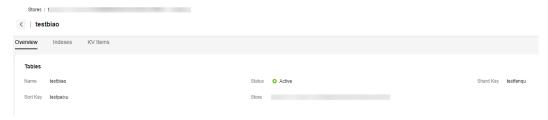
# **Prerequisites**

The table you want to query details about has been created.

# **Procedure**

- **Step 1** Log in to the KVS console.
- **Step 2** In the navigation pane, choose **Stores**.
- **Step 3** Search for and select a store. The store details page is displayed.
- **Step 4** Search for and select a table you want to guery details about.

Figure 3-9 Table details page



**Step 5** On the table details page, check the overview, indexes and KV items of the table.

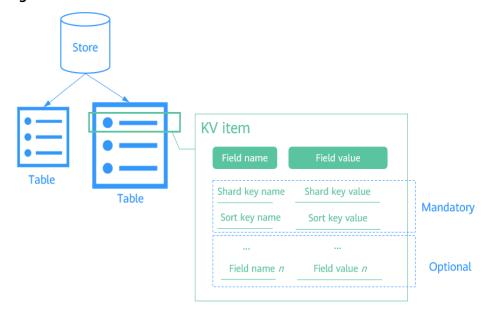
----End

**4** KV Items

# 4.1 KV Item Overview

A key-value (KV) item is the smallest unit for storing data in KVS. Each item is a document. Each item belongs to a table in a store. Each table contains one or more KV items. Each KV item has a unique identifier. Suppose you have a table for storing the employee information in a department. The information of each employee is stored in a KV item, which is uniquely identified by the employee ID.

Figure 4-1 KV item overview



A KV item contains mandatory and optional fields. You must specify two mandatory fields: shard key and sort key. Optional fields can be added as required.

The example below creates KV items for two employees, using SSN as the shard key and Name as the sort key. Gender, Job, and Award Records are optional fields.

Employee {

```
"SSN": 0123456789,
"Name": "Tom",
}
{
    "SSN": 9876543210,
    "Name": "Amy",
    "Gender": "female",
    "Job": "O&M staff",
    "Award Records": "Best Employee Award"
}
```

You can add, update, delete, and scan KV items.

Table 4-1 KV item features

Feature	Description
Adding a KV item	Add a KV item to a table.
Updating a KV item	Update a KV item.
Deleting a KV item	Delete a KV item.
Scanning KV Items	Scan KV items.

# 4.2 Adding a KV Item

# **Scenarios**

You will add a KV item to a table.

# **Prerequisites**

The table where you want to add a KV item has been created.

### **Notes and Constraints**

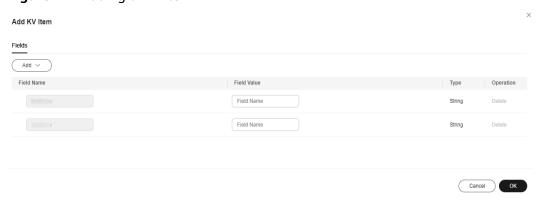
- The KV data type can be a string, Boolean value, null value, floating-point number, array, mapping, date, or ObjectId. The total size of keys and values in a KV item cannot exceed 512 KB, including the primary key and local secondary indexes.
- A field name must be 1 to 63 bytes long. It is case sensitive and cannot contain periods (.) or dollar signs (\$). A field name prefixed with X is a reserved name. The existing reserved field names are Xattr and Xblob. You are advised not to use them as field names.

# **Procedure**

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

- **Step 2** In the navigation pane, choose **Stores**.
- **Step 3** Search for and select a store and then a table where you want to add a KV item.
- **Step 4** Click the **KV Items** tab.
- Step 5 Click Add KV Item in the upper left corner.

Figure 4-2 Adding a KV item



- **Step 6** Specify the mandatory fields of the shard key and sort key.
- **Step 7** (Optional) To add other fields, click **Add**. Choose a KV data type and specify the field name and value. The KV type can be a string, Boolean value, null value, floating-point number, integer, long integer, array, mapping, binary value, date, timestamp, regular expression, Decimal128 value, or ObjectId.
- **Step 8** Confirm the configuration and click **OK**.
- **Step 9** Check whether the KV item you added is in the KV list.

# 4.3 Updating a KV Item

# **Scenarios**

You will update an existing KV item.

# **Prerequisites**

The KV item you want to update has been added.

## **Notes and Constraints**

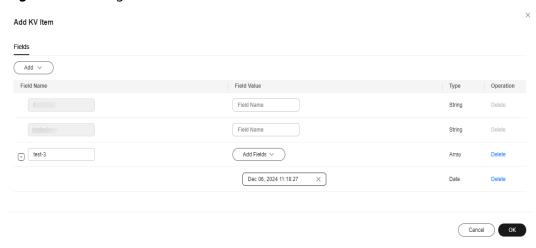
Shard keys and sort keys cannot be updated.

### **Procedure**

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

- **Step 2** In the navigation pane, choose **Stores**.
- **Step 3** Search for and select a store and then a table where you want to update a KV item.
- Step 4 Click the KV Items tab.
- **Step 5** Search for and select the KV item you want to update and click **Edit** in the **Operation** column.

Figure 4-3 Editing a KV item



- **Step 6** Modify field names and values as required. Note that you cannot modify the shard key and sort key and their values.
- **Step 7** Confirm the modification and click **OK**.
- **Step 8** Check whether the KV item has been updated in the KV list.

# 4.4 Deleting a KV Item

### **Scenarios**

You will delete a KV item.

# **Prerequisites**

The KV item you want to delete has been added.

### **Procedure**

- **Step 1** Log in to the KVS console.
- **Step 2** In the navigation pane, choose **Stores**.
- **Step 3** Search for and select a store and then a table where you want to delete a KV item.

- **Step 4** Click the **KV Items** tab.
- **Step 5** Search for and select a KV item to be deleted and click **Delete** in the **Operation** column.

Figure 4-4 Deleting a KV item



- **Step 6** In the displayed dialog box, click **OK**.
- **Step 7** Check whether the KV item has been deleted from the KV list.

# 4.5 Scanning KV Items

### **Scenarios**

You will check KV items in a table.

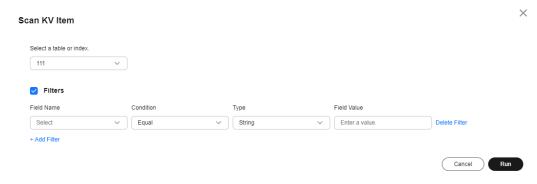
# **Prerequisites**

The KV items you want to check have been added.

### **Procedure**

- **Step 1** Log in to the KVS console.
- **Step 2** In the navigation pane, choose **Stores**.
- **Step 3** Search for and select a store and then a table where you want to check KV items.
- Step 4 Click the KV Items tab.
- **Step 5** Click **Scan KV Item** in the upper left corner.

Figure 4-5 Scan KV Item page



- **Step 6** In the dialog box, select a table or index from the drop-down list.
- **Step 7** (Optional) Select **Filters** and select or enter filter criteria.

Table 4-2 Filter criteria

Parameter	Description
Field Name	A field name in KV items. You can select the shard key or sort key of the base table, local secondary index, or global secondary index.
Condition	The condition can be Equal, Greater Than, Less Than, Greater Than Or Equal, Less Than Or Equal, Not Equal, Prefix, Included In, Not Included In, or Exists. For Included In and Not Included In, you can enter or select multiple types and corresponding values.
Туре	The value can be a string, integer, long integer, floating- point number, Boolean value, date, binary value, timestamp, or ObjectId.
Value	Enter or select the field value of the corresponding type.

**Step 8** Click **Run**. The KV items that meet the filter criteria are displayed in the list.

**Ⅲ** NOTE

A maximum of 50 KV items can be displayed in a scan. If there are over 50 KV items found, the message "This table has more KV items. Click to scan more. Scan next page" is displayed.

**Step 9** (Optional) If you want to check KV items that are not displayed, click **Scan next page**. A maximum of 50 KV items are displayed, and the previously scanned items are retained.

Figure 4-6 Scan next page



----End

5 Indexes

# 5.1 Index Overview

An index lets you query the data in the table using a different primary key from the base table, enabling faster and more accurate retrieval. KVS supports local and global secondary indexes. Indexes can be created, queried, and deleted.

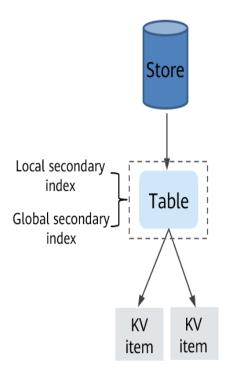
# **Local Secondary Indexes**

A local secondary index has the same shard key as its base table, but a different sort key. It is supported for tables with a composite primary key (shard key and sort key) and helps accelerate queries through the specified sort key. When a KV item is written, a local secondary index item is automatically generated and stored with strong consistency.

# **Global Secondary Indexes**

A global secondary index has a different shard key from the base table. Each index item stores only the index data. Other data in the corresponding KV item is not included. When a KV item is written, an index item is automatically generated and then asynchronously written to the global secondary index with eventual consistency.

Figure 5-1 Index overview



You can create, query, and delete indexes.

Table 5-1 Index features

Feature	Description
Creating Indexes	Create indexes for a table.
Querying Indexes	Query all indexes in a table.
Deleting an Index	Delete an index during table creation.

# **5.2 Creating Indexes**

# **Scenarios**

You will create indexes for a table.

# **Prerequisites**

The table you want to create indexes for has been created.

# **Notes and Constraints**

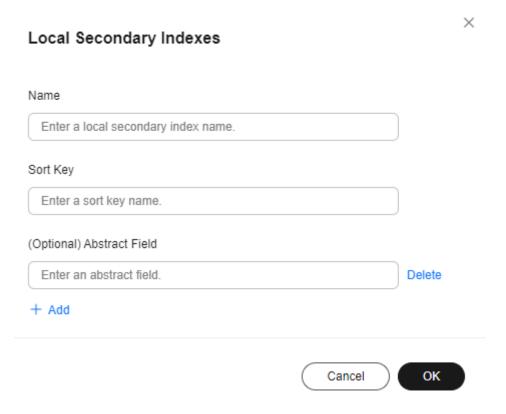
• A maximum of five local secondary indexes and 20 global secondary indexes can be created for a table.

- Indexes can only be created during table creation.
- Duplicate composite primary keys (shard key and sort key) are not allowed for multiple global secondary indexes of a table.
- Duplicate keys are not allowed in a single global secondary index.
- A global secondary index cannot have the same shard key as its base table.
- Duplicate sort keys are not allowed for multiple local secondary indexes of a table.
- Duplicate keys are not allowed in a single local secondary index.
- A local secondary index cannot have the same shard key as its base table.
- A local secondary index cannot have the same sort key as its base table.

## **Procedure**

- **Step 1** Log in to the KVS console.
- **Step 2** In the navigation pane, choose **Stores**.
- **Step 3** Search for and select a store where you want to create indexes and click **Create Table** in the **Operation** column. Or you can click the store name to go to its details page and click **Create Table**.
- **Step 4** Select a billing mode, enter table details, and configure the provisioned read and write throughput (only required for the provisioned billing mode).
- **Step 5** In the **Secondary Index** area, create secondary indexes. KVS allows you to create local and global secondary indexes.
  - 1. Click **Create Local Secondary Index** and configure parameters as instructed in **Table 5-2**. Confirm the configuration and click **OK**.

Figure 5-2 Local Secondary Indexes

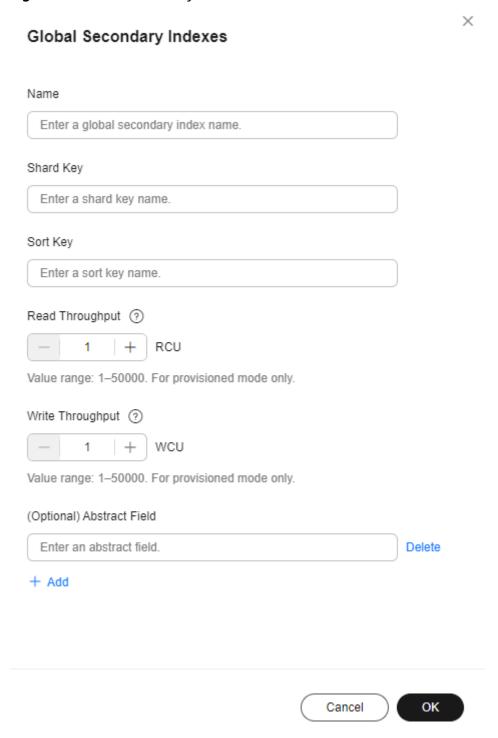


**Table 5-2** Local secondary index parameters

Туре	Parameter	Description
Create Local Secondary Index	Name	Mandatory The name of a local secondary index. It must be 1 to 255 characters long. Numbers (0–9), letters (a–z and A–Z), hyphens (-), underscores (_), and periods (.) are allowed. An index name cannot be <b>XPriIndex</b> .
	Sort Key	Mandatory A sort key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Abstract Field	Optional  An abstract field in the local secondary index. You can create multiple abstract fields in an index. An abstract field must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.

2. Click **Create Global Secondary Index** and configure parameters as instructed in **Table 5-3**. Confirm the configuration and click **OK**.

Figure 5-3 Global Secondary Indexes



**Table 5-3** Global secondary index parameters

Туре	Parameter	Description
Create	Name	Mandatory
Global Secondary Index		The name of a global secondary index. It must be 1 to 255 characters long. Numbers (0–9), letters (a–z and A–Z), hyphens (-), underscores (_), and periods (.) are allowed. An index name cannot be <b>XPriIndex</b> .
	Shard Key	Mandatory
		A shard key must be 1 to 63 characters long and cannot start with an underscore (_).  Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Sort Key	Optional
		A sort key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Read Throughput	Value range: 1 to 50000 (unit: RCU) This field is only valid in the provisioned billing mode.
	Write Throughput	Value range: 1 to 50000 (unit: WCU) This field is only valid in the provisioned billing mode.
	Abstract Field	Optional
		An abstract field in the global secondary index. You can create multiple abstract fields in an index. An abstract field must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.

**Step 6** Confirm the configuration and click **OK**.

----End

# **5.3 Querying Indexes**

# **Scenarios**

You will query the indexes of a table.

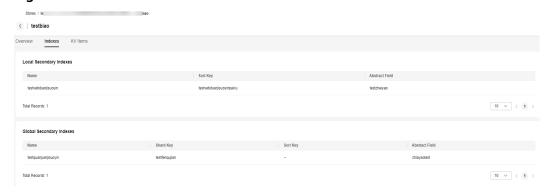
# **Prerequisites**

The indexes you want to query have been created.

## **Procedure**

- **Step 1** Log in to the KVS console.
- **Step 2** In the navigation pane, choose **Stores**.
- **Step 3** Search for and select a store that contains the table where you want to query indexes.
- **Step 4** Search for and select a table where you want to query indexes.
- **Step 5** Click the **Indexes** tab to check all indexes for that table.

Figure 5-4 Indexes



----End

# 5.4 Deleting an Index

## **Scenarios**

You will delete an index during table creation.

# **Prerequisites**

The index to be deleted has been created and you have not completed the table creation.

# **Notes and Constraints**

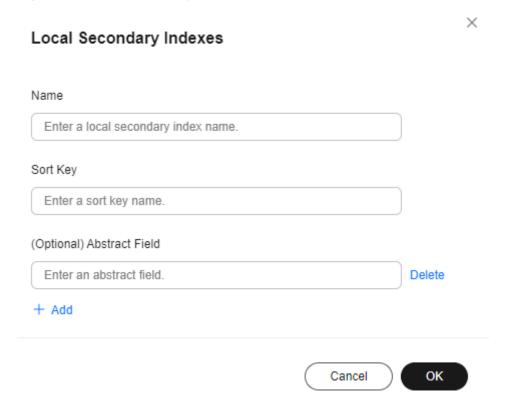
You can only delete indexes during table creation.

#### **Procedure**

- **Step 1** Log in to the KVS console.
- **Step 2** In the navigation pane, choose **Stores**.
- **Step 3** Search for and select a store and click **Create Table** in the **Operation** column. Or you can click the store name to go to its details page and click **Create Table**.

- **Step 4** Select a billing mode, enter table details, and configure the provisioned read and write throughput (only required for the provisioned billing mode).
- **Step 5** In the **Secondary Index** area, create secondary indexes. KVS allows you to create local and global secondary indexes.
  - 1. Click **Create Local Secondary Index** and configure parameters as instructed in **Table 5-4**. Confirm the configuration and click **OK**.

Figure 5-5 Local Secondary Indexes



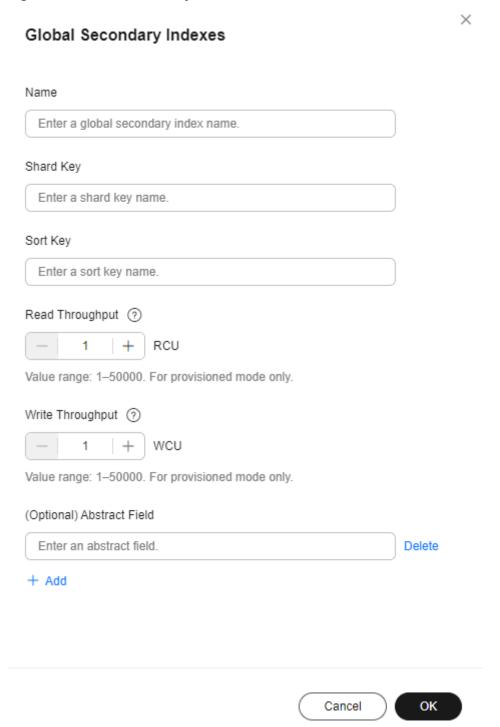
**Table 5-4** Local secondary index parameters

Туре	Parameter	Description
Create Local Secondary Index	Name	Mandatory The name of a local secondary index. It must be 1 to 255 characters long. Numbers (0–9), letters (a–z and A–Z), hyphens (-), underscores (_), and periods (.) are allowed. An index name cannot be <b>XPriIndex</b> .
	Sort Key	Mandatory A sort key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.

Туре	Parameter	Description
	Abstract Field	Optional  An abstract field in the local secondary index. You can create multiple abstract fields in an index. An abstract field must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0–9), letters (a–z and A–Z), hyphens (-), and underscores (_) are allowed.

2. Click **Create Global Secondary Index** and configure parameters as instructed in **Table 5-5**. Confirm the configuration and click **OK**.

Figure 5-6 Global Secondary Indexes



**Table 5-5** Global secondary index parameters

Туре	Parameter	Description
Create Global Secondary Index	Name	Mandatory The name of a global secondary index. It must be 1 to 255 characters long. Numbers (0–9), letters (a–z and A–Z), hyphens (-), underscores (_), and periods (.) are allowed. An index name cannot be <b>XPriIndex</b> .
	Shard Key	Mandatory A shard key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Sort Key	Optional  A sort key must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.
	Read Throughput	Value range: 1 to 50000 (unit: RCU) This field is only valid in the provisioned billing mode.
	Write Throughput	Value range: 1 to 50000 (unit: WCU) This field is only valid in the provisioned billing mode.
	Abstract Field	Optional
		An abstract field in the global secondary index. You can create multiple abstract fields in an index. An abstract field must be 1 to 63 characters long and cannot start with an underscore (_). Numbers (0-9), letters (a-z and A-Z), hyphens (-), and underscores (_) are allowed.

**Step 6** In the **Secondary Index** area, locate the index to be deleted and click **Delete** in the **Operation** column.

Figure 5-7 Deleting an index



----End

# 6 Viewing Monitoring Metrics and Creating Alarm Rules

# **6.1 Monitoring Metrics**

# **Feature Description**

This section describes the namespace, metrics, and dimension of KVS monitoring on Cloud Eye. You can check metric details and alarms generated for KVS on the Cloud Eye console or using APIs.

# Namespace

SYS.KVS

# **Monitoring Metrics**

Table 6-1 KVS metrics

Metric ID	Met ric Na me	Description	Val ue Ran ge	Unit	Conv ersio n Rule	Moni tored Obje ct	Monitori ng Interval (Raw Data)
store_k v_reque st_coun t	Total Requ ests	Measures the total number of requests within an interval.	≥ 0	Coun t	N/A	Store s	1 min
store_re quest_c ount_m onitor_ 2XX	2xx Stat us Code s	Measures the number of requests whose response status code is 2xx.	≥ 0	Coun t	N/A	Store s	1 min

Metric ID	Met ric Na me	Description	Val ue Ran ge	Unit	Conv ersio n Rule	Moni tored Obje ct	Monitori ng Interval (Raw Data)
store_re quest_c ount_m onitor_ 4XX	4xx Stat us Code s	Measures the number of requests whose response status code is 4xx.	≥ 0	Coun t	N/A	Store s	1 min
store_re quest_c ount_m onitor_ 5XX	5xx Stat us Code s	Measures the number of requests whose response status code is 5 <i>xx</i> .	≥ 0	Coun t	N/A	Store s	1 min
store_k v_reque st_laten cy_ave	Aver age Requ est Late ncy	Measures the average duration from when the system received a request to when the system returned a response within an interval.	≥ 0	ms	N/A	Store s	1 min
store_re ad_traff ic	GET Requ est Traff ic	Measures the total size of the KV items read within an interval.	≥ 0	Byte	1024( IEC)	Store s	1 min
store_w rite_traff ic	PUT Requ est Traff ic	Measures the total size of the KV items written within an interval.	≥ 0	Byte	1024( IEC)	Store s	1 min

# **Dimensions**

Key	Value
store_name	The store dimension. The value is a store name.

# 6.2 Creating an Alarm Rule

# **Scenarios**

You will create an alarm rule for KVS on Cloud Eye.

You can monitor your KVS resources on Cloud Eye in real time and use alarm and notification policies to be alerted immediately if an exception occurs.

# **Prerequisites**

You have obtained the permissions to create alarm rules. If you have not, contact your administrator. For details about related permissions, see **Cloud Eye Permissions**.

# **Procedure**

- **Step 1** Log in to the **console**.
- **Step 2** In the service list, under **Management & Governance**, click **Cloud Eye**.
- **Step 3** In the navigation pane, choose **Alarm Management** > **Alarm Rules**.
- **Step 4** On the displayed **Alarm Rules** page, click **Create Alarm Rule**.
- **Step 5** On the **Create Alarm Rule** page, follow the on-screen instructions to create an alarm rule for KVS. For more information, see **Creating an Alarm Rule**.
- **Step 6** Confirm the settings and click **Create**. For more information about alarm rules, see **Cloud Eye User Guide**.

----End

# **6.3 Checking Monitoring Metrics**

You will check KVS monitoring metrics on the Cloud Eye console.

# **Prerequisites**

At least one request for KVS has been reported (about 10 minutes) to Cloud Eye after a new store was created.



If there are no KVS requests reported for about two hours, the Cloud Eye console does not show any monitoring data. The data will be shown again about 10 minutes after a new KVS request is reported.

# **Checking Monitoring Metrics**

- **Step 1** Log in to the **console**.
- Step 2 In the service list, under Management & Governance, click Cloud Eye.
- **Step 3** In the navigation pane, choose **Cloud Service Monitoring** > **Key-Value Storage Service KVS**.
- **Step 4** Find the required resource and click **View Metric** in the **Operation** column.

You can view metric data from the last 1, 3, 12, or 24 hours, as well as the last 7 days.

----End

# Using a VPC Endpoint to Access KVS

## Overview

A VPC endpoint is required when you want to access KVS using SDKs or APIs.

To access KVS through a VPC endpoint, do the following:

- 1. Buy a VPC endpoint that is used for connecting to interface VPC endpoint services.
- 2. Create a private zone.
- 3. Add an A record.

#### **NOTICE**

The domain name of a private zone you created when buying a VPC Endpoint is the endpoint you will use when accessing KVS through APIs or SDKs.

#### **Precautions**

- KVS currently supports only access within the same region. Make sure the VPC endpoint you buy for KVS is in the same region where your KVS resources are.
- To ensure service redundancy, you are advised to buy different VPC endpoints for different VPC endpoint service names for KVS.

#### **Procedure**

- **Step 1** Log in to the **console**.
- **Step 2** Click  $\bigcirc$  in the upper left corner to select a region.
- **Step 3** Buy an interface VPC endpoint for KVS.
  - 1. Click Service List and choose Networking > VPC Endpoint.
  - 2. On the displayed page, click **Buy VPC Endpoint**.
  - On the displayed page, configure the parameters.
     For parameter details, see Buying a VPC Endpoint for Accessing Interface VPC Endpoint Services.

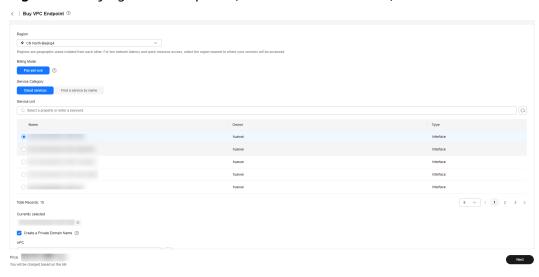


Figure 7-1 Buying a VPC endpoint (Cloud services-Interface)

Table 7-1 VPC endpoint parameters

Parameter	Description
Region	The region where a VPC endpoint will be. Resources in different regions cannot communicate with each other over an intranet. Select the region closest to you to enjoy rapid access.
Billing Mode	VPC endpoints only support pay-per-use billing based on the duration of use and can be created or deleted at any time.
Service	There are two options:
Category	<ul> <li>Cloud services: Select this option if the VPC endpoint service to be accessed is a cloud service.</li> </ul>
	<ul> <li>Find a service by name: Select this option if the VPC endpoint service to be accessed is a private service of your own.</li> </ul>
Service List	This parameter is available only when you select <b>Cloud</b> services for <b>Service Category</b> .
	Select com.myhuaweicloud.{Regionid}.kvs.
VPC Endpoint Service	This parameter is available only when you select <b>Find a service by name</b> for <b>Service Category</b> .  Enter <b>com.myhuaweicloud.</b> { <i>Regionid</i> }. <b>kvs</b> .
Name	, , ,
Create a Private Domain Name	If you want to access the VPC endpoint using its domain name, select this option.
VPC	The VPC where the VPC endpoint will be.
Subnet	The subnet where the VPC endpoint will be.

Parameter	Description
IPv4 Address	The private IP address of the VPC endpoint. An IPv4 address can be automatically assigned or manually specified.
Access Control	It controls IP addresses and CIDR blocks that are allowed to access the VPC endpoint.
	<ul> <li>If Access Control is enabled, only IP addresses or CIDR blocks in the whitelist are allowed to access the VPC endpoint.</li> </ul>
	<ul> <li>If Access Control is disabled, any IP addresses or CIDR blocks can access the VPC endpoint.</li> </ul>
Whitelist	This parameter lists the IP addresses or CIDR blocks that are allowed to access the VPC endpoint. You can add up to 20 records.
	0.0.0.0 and CIDR blocks in x.x.x.x/0 format are not supported.
Tag	Optional
	The identifier of the VPC endpoint, which consists of a key and a value. You can add up to 10 tags to a VPC endpoint.

## 4. Click Next.

- If you do not need to modify the settings, click **Submit**.
- If you need to modify the settings, click **Previous**, modify them, and then click **Submit**.

## **Step 4** Create a private zone.

- 1. Click **Service List** and choose **Network > Domain Name Service**.
- 2. In the navigation pane, choose **Private Zones**.
- 3. Click Create Private Zone.
- 4. Configure the parameters.

For parameter details, see **Creating a Private Zone**.

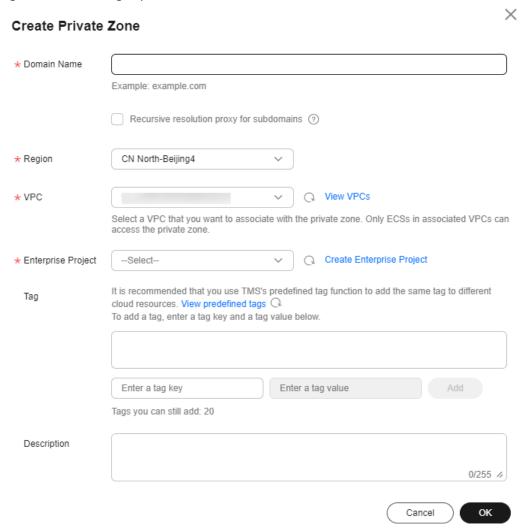


Figure 7-2 Creating a private zone

Table 7-2 Parameters for creating a private zone

Parameter	Description
Domain Name	The domain name of the private zone. Enter kvs.{Regionid}.myhuaweicloud.com.
Region	The region where the private zone will be.
VPC	The VPC to be associated with the private zone.  NOTE  The VPC you choose must be the VPC where your servers (such as ECSs) are. Otherwise, the domain name cannot be resolved.

Parameter	Description
Enterprise Project	The enterprise project to be associated with the private zone. You can manage private zones by enterprise project.
	NOTE This parameter is available and mandatory only when Account Type is set to Enterprise Account.
Tag	Optional
	The identifier of the private zone. Each tag contains a key and a value. Each private zone can have up to 10 tags.
Description	Optional
	The description of the private zone. You can enter a maximum of 255 characters.

# **Step 5** Add A records.

- 1. In the private zone list, search for and select **kvs**. *{Regionid}*.**myhuaweicloud.com** you just specified when **creating a private zone**.
- 2. Click Add Record Set.
- 3. In the displayed drawer, configure the record parameters. For parameter details, see **Adding an A Record Set**.

Figure 7-3 Adding an A record

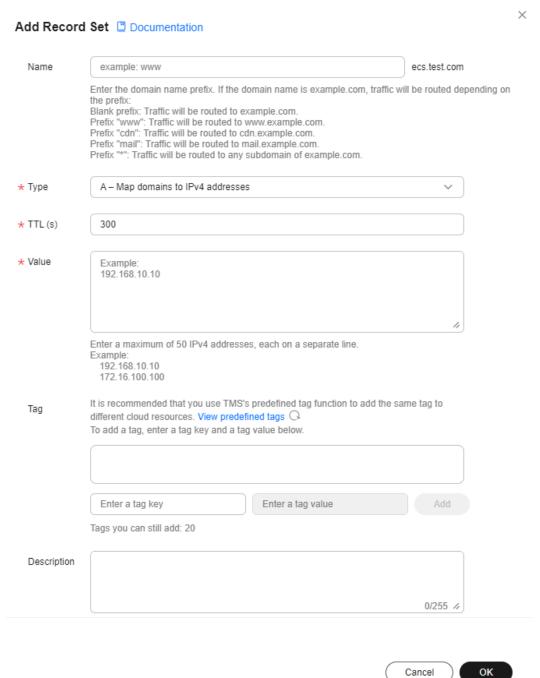


Table 7-3 Parameters for configuring an A record

Parameter	Description
Name	The prefix of the domain name to be resolved.
	Leave it blank.

Parameter	Description
Туре	The type of the record.
	Select <b>A - Map domains to IPv4 addresses</b> from the drop-down list.
TTL (s)	How long each record can be cached on a local DNS server, in seconds.
	The value ranges from 1 to 2147483647, and the default is 300.
Value	The IPv4 addresses mapped to the domain name.
	You can enter up to 50 different addresses, each on a separate line.
Weight	Optional
	The weight of the record. The value ranges from <b>0</b> to <b>1000</b> , and the default value is <b>1</b> .
Tag	Optional
	The identifier of the record, which consists of a key and a value. You can create up to 10 tags for a record.
Description	Optional
	The description of the domain name. You can enter a maximum of 255 characters.

- 4. Click **OK**. Check the record you just added in the record set list. If its status is **Normal**, its addition is successful.
- 5. Repeat this step to add another A record where Name is \*.

----End