Conversational Bot Service

User Guide

Issue 01

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HUAWEI TECHNOLOGIES CO., LTD.

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Notice

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Contents

1 IAM Permissions Management

1.1 Creating a User and Granting CBS Permissions

This section describes how to use IAM to implement fine-grained permissions control for your Conversational Bot Service (CBS) resources. With IAM, you can:

- Create IAM users for employees based on your enterprise's organizational structure. Each IAM user will have their own security credentials for accessing CBS resources.
- Grant only the permissions required for users to perform a specific task.
- Entrust a HUAWEI CLOUD account or cloud service to perform efficient O&M on your CBS resources.

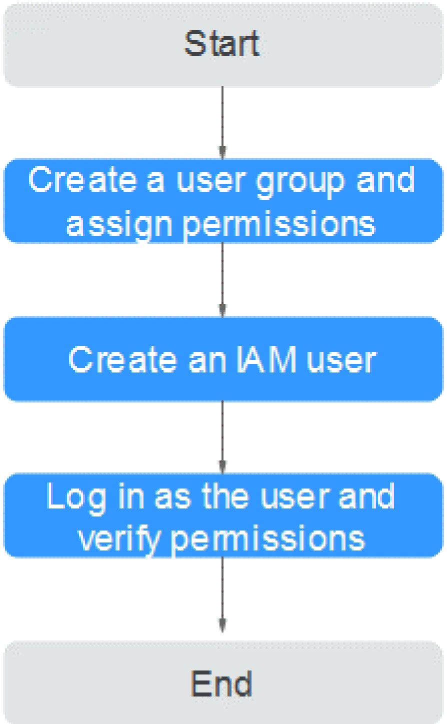
If your HUAWEI CLOUD account does not require individual IAM users, skip this section.

Prerequisites

Learn about the permissions (see **Permissions Management** supported by CBS and choose policies or roles suited to your requirements. For permissions of other services, see **System Permissions**.

Process Flow

Figure 1-1 Process for granting CBS permissions



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

   Create a user group on the IAM console, and attach the **CBS Operator** policy to the group.

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** as the user and verify permissions.

   Log in to the CBS console with the user created in **2**, and verify that the user only has read permissions for CBS.

   – Choose **Service List** > **Conversational Bot Service**. Then click **Buy Q&A Bot** on the CBS console. If a message appears indicating insufficient permissions to perform the operation (for example, there is only the **CBS Viewer** policy), the **CBS Viewer** policy has already taken effect.

   – Choose any other service in the **Service List** (for example, there is only the **CBS Viewer** policy). If a message appears indicating insufficient permissions to access the service, the **CBS Viewer** policy has already taken effect.

2 QABot

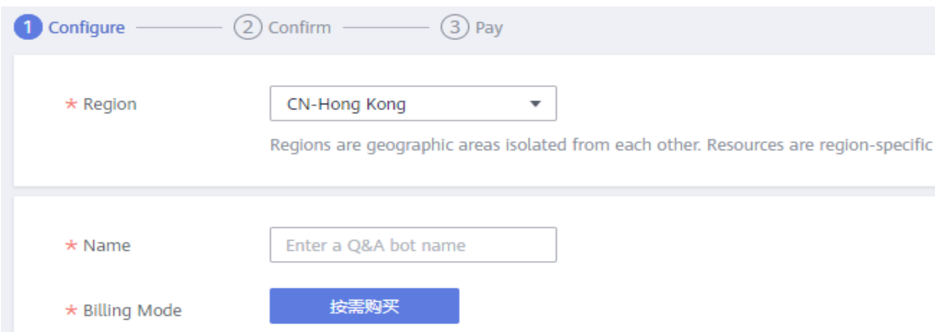
2.1 Purchasing a Q&A Bot

Before using QABot, you need to purchase an intelligent Q&A bot. Basic edition is now supported. API calling is billed separately. If QABot stops providing services, delete or unsubscribe Q&A bots to release resources.

Buying a Q&A Bot

1. From the left navigation pane of the CBS console, click **Question Answering Bot**. On the displayed page, click **Buy Q&A Bot** in the upper right corner.
2. On the displayed **Buy Q&A Bot** page, specify parameters as required. The fees are displayed in the lower part of the page for your reference.
   - **Region**: nearest region to your customer base for quick resource access and low network latency.
   - **Q&A Bot Name**: uniquely identifies a bot. The value consists of letters, digits, and certain special characters (including _, **-**, and **#**). The value contains 1 to 63 characters, such as **QABotdemo1**.
   - **Billing Mode** includes **Pay-per-use**.
     - **Pay-per-use**: You can purchase a Q&A bot based on your needs.

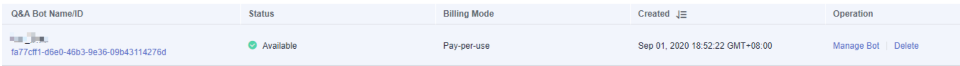
Figure 2-1 Purchasing a Q&A bot



3. Click **Next** in the lower right corner to switch to the **Confirm** page.
4. After confirming the information on the **Confirm** page, click **Pay Now**.

   In the Q&A bot list on the **Question Answering Bot** page, the status of the purchased Q&A bot is **Creating**. After the Q&A bot is successfully created, its status automatically switches to **Available**. See the following figure.

Figure 2-2 Q&A bot list



Q&A Bot Name/ID	Status	Billing Mode	Created	Operation
fa77cff1-d6e0-46b3-9e36-09b43114276d	Available	Pay-per-use	Sep 01, 2020 18:52:22 GMT+08:00	Manage Bot | Delete

2.2 Managing Q&A Bots

2.2.1 Managing the Knowledge Base

After creating an intelligent Q&A bot, you need to add Q&A data to the knowledge base.

To access the knowledge base function, log in to the CBS console and click **Question Answering Bot** in the left navigation pane. In the Q&A bot list, click the bot ID or the **Manage Bot** button in the **Operation** column. From the left navigation pane of the **Q&A Bot** page, click **Knowledge Base**.

The knowledge base manages question categories and Q&A pairs. It includes the following functions:

- Q&A Pairs

Q&A Pairs

The **Q&A Pairs** page manages question categories and Q&A pairs. Each question belongs to a question category. A complete Q&A pair includes a question, alternative question, and answer.

- Managing question categories

  Question categories are used to distinguish and manage questions in different scenarios and domains, for example, questions concerning greeting, consulting, or troubleshooting. A maximum of 1,000 question categories are allowed.

  On the **Q&A Pairs** page, you can manage question categories in the left area, where you can perform the following operations:

  – Creating a question category: Click to create a question category.
  – Deleting a question category: Select an existing question category and click to delete it.
  – Editing a question category: Select an existing question category and click to edit it. Only the question category name can be edited.
  – Updating the question category list: Click to update the question category list.

- Searching for the desired question category: In the search text box, enter the keyword of the question category name and click .
- Dragging a question category: Drag a question category or question to the same level or different levels.
- Adding a sub-category: Move the pointer to a question category and click on the right of the category name to create a sub-category.

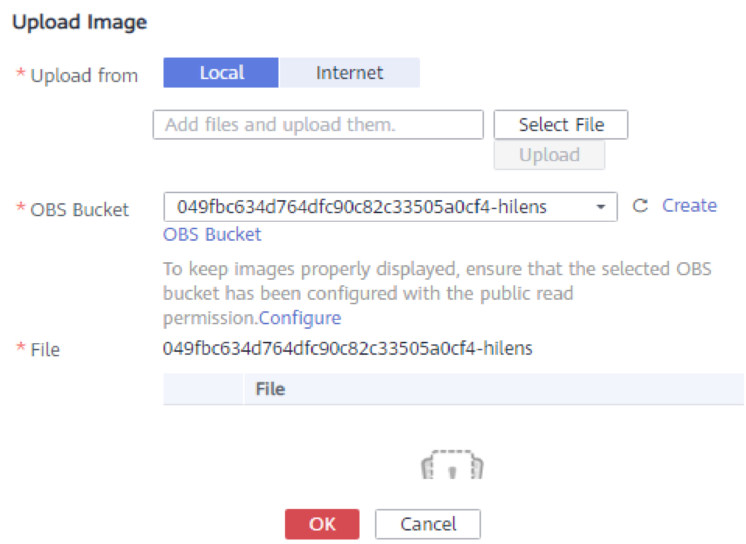
- Managing questions

  You can create, edit, and delete questions. The operations take effect immediately. You can import Q&A pairs and modify question categories in batches. You can filter and search for questions by time and question keyword.

  - Creating Q&A pairs
    - **Question Category**: Select an existing question category from the drop-down list. You can search for created question categories. If no question category is available, create one.
    - **Question** indicates a user question. A question contains up to 512 characters.
    - **Alternative Question**: indicates a question similar to the user question, that is, other statements that a user may use when asking a question. Adding alternative questions helps improve Q&A performance. To add an alternative question, click . An alternative question can contain up to 512 characters. A maximum of 200 alternative questions are allowed.
    - **Answer**: indicates the answer to the question. Answers can be in rich text format and you can set the font, image, and source code.
      - Uploading an image

      1) In the text box, click the image button. The **Upload Image** dialog box is displayed.

Figure 2-3 Uploading an image



2) Select the location of the image to be uploaded.

Local: If you select this option, steps 3 and 4 are required.

Internet: If you select this option, enter the corresponding image link and click **OK**.

3) Select an OBS bucket.

The image to be uploaded should be stored in a folder of the OBS bucket. To keep images properly displayed, ensure that the selected OBS bucket has the public read permission.

4) Select the image to be uploaded and click **OK**.

- Performing operations on Q&A pairs in batches

  You can modify question categories or delete Q&A pairs in batches.

- Importing Q&A pairs

  a. On the displayed **Q&A Pairs** page, click **Import**.

  b. In the displayed dialog box, set parameters as required and click **OK**.

     File: Select the target Q&A pair file. Only one file can be imported at a time. If you do not know the data format, click the link to download the file template.

  c. After Q&A pairs are imported successfully, all the Q&A pairs will be displayed in the list on the **Q&A Pairs** page.

- Editing Q&A pairs

  You can edit the existing Q&A pairs based on service changes. The following information about Q&A pairs can be edited: question category, question, and answer.

  a. On the **Q&A Pairs** page, locate the row where the target Q&A pair resides and click **Edit** in the **Operation** column.

  b. In the displayed **Edit Q&A Pair** dialog box, specify the following parameters as required: **Question Category**, **Question**, and **Answer**.

  c. Click **OK**.

- Deleting Q&A pairs

  Certain Q&A pairs may become invalid when business changes occur. You can delete one or more Q&A pairs to release resources. Deleted Q&A pairs cannot be recovered. Exercise caution when performing this operation.

  – To delete a single Q&A pair, perform the following operations: In the Q&A pair list on the **Q&A Pairs** page, locate the row where the target Q&A pair resides and click **Delete** in the **Operation** column.

  – To delete multiple Q&A pairs in batches, perform the following operations: In the Q&A pair list on the **Q&A Pairs** page, select the target Q&A pairs and choose **Batch Operate > Delete** above the Q&A pair list.

2.2.2 Invoking a Q&A Bot

After configuring the Q&A data, you can directly invoke a Q&A bot by starting a dialog on the CBS console or calling APIs to implement Q&A services for your customers.

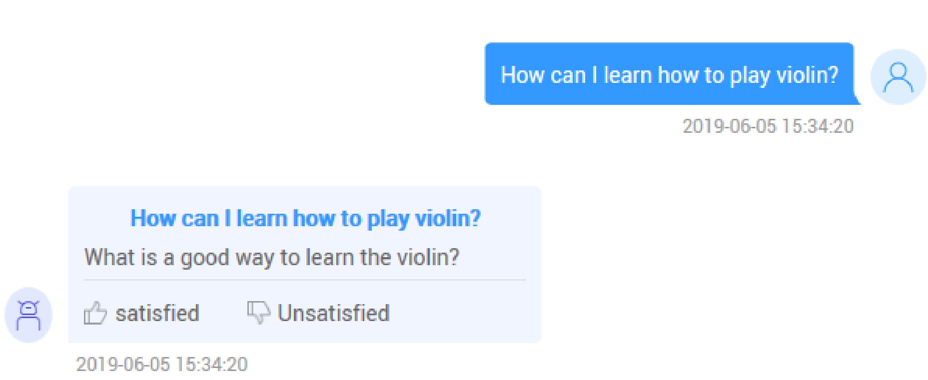
You need to develop your Q&A console based on your service requirements. After receiving a customer question, the Q&A console calls related Q&A bot APIs, interacts with the Q&A bot, and displays the answer returned by the bot to the customer. During the interaction, the Q&A bot searches the knowledge base for the customer question and returns the answer.

Starting a Dialog on the Console

After Q&A pairs are imported to a Q&A bot, you can click **Start Dialog** in the upper right corner to start conversations with the bot.

1. Log in to the CBS console and click **Question Answering Bot** in the left navigation pane. In the Q&A bot list, click the bot ID or the **Manage Bot** button in the **Operation** column.
2. On the **Q&A Bot** page, click **Start Dialog** in the upper right corner to open the dialog window. In the dialog box, enter your question or click the recommended question returned by the system to obtain the answer.

Figure 2-4 Starting a dialog



Calling APIs

Common APIs used for QABot are as follows:

- **Obtaining questions prompted when a user enters a question**

  If you do not know how to ask a question about the existing problem, you can enter a keyword of the question to obtain a prompt about your question from QABot.

  In the following example, you want to ask a question about cloud desktops.

  – Example request

```
POST https://{endpoint}/v1/41551a23c2be484cb0070631e323ee52/qabots/
b36a01da-7fc2-43f8-8990-218e57a94420/chat

Request Header:
Content-Type: application/json
X-Auth-Token:
MIINRwYJKoZIhvcNAQcCoIINODCCDTQCAQExDTALBglghkgBZQMEAgEwgguVBgkqhkiG...
Request Body:
{
   "question": "What should I do if I cannot open my cloud desktop?"
}
```

  – Example response

  ■ Successful example response

```
{
   "questions":[
```

```
        "What should I do If I cannot open my cloud desktop?",
        "What should I do if I fail to log in to my cloud desktop?"
    ]
}
```

- Failed example response

```
{
  "error_code": "CBS.0022",
  "error_msg": "question can not be null"
}
```

- **Q&A request**

  After you send a question to a Q&A bot through the API, if the Q&A bot finds the answer in the knowledge base through semantic matching, it returns the answer; otherwise, a failure message is returned.

  – Example request

```
POST https://{endpoint}/v1/1604d8170cd84440a81281e5a3a04f8b/qabots/303a0a00-c88a-43e3-aa2f-d5b8b9832b02/requests
Request Header:
Content-Type: application/json
X-Auth-Token: MIINRwYJKoZIhvcNAQcCoIINODCCDTQCAQExDTALBglghkgBZQMEAgEwgguVBgkqhkiG...
Request Body:
{
    "user_id": "z00123456",
    "session_id": "xxxxxxxxxxxxxxxxxx",
    "operate_type":3,
       "question":"What should I do if I fail to log in to my cloud desktop?"
}
```

  – Example response

- Successful example response

  1. If the internal threshold is disabled (**threshold_enable** is set to **false**), the number of returned results is based on the value of **top**.

```
{
    "request_id": "303a0a00-c88a",
    "question": "What should I do If I cannot open my cloud desktop?",
    "answers": [
        {
            "qa_pair_id":"123",
            "st_question":"Why does my cloud desktop fail to be opened?",
            "answer":"Incorrect user account.",
            "score":0.952,
            "domain":"Cloud desktop"
      },
      {
            "qa_pair_id":"123",
            "st_question":"Why would my desktop fail to be opened?",
            "answer":"Incorrect user account.",
            "score":0.901,
            "domain":"Cloud desktop"
        },
        {
            "qa_pair_id":"123",
            "st_question":"What is cloud desktop?",
            "answer": "Cloud desktop is a system that supports remote office.",
            "score":0.352,
            "domain":"Cloud desktop"
        },
      {
            "qa_pair_id":"123",
            "st_question": "Why does my computer desktop fail to be opened?",
            "answer": "Check whether the monitor is started.",
            "score":0.352,
            "domain":"Cloud desktop"
        },
```

```
    ]
}
```

2. Enable the internal threshold.

Table 2-1 Internal threshold description

No.	Condition	Result
Case 1	The highest Q&A pair score is greater than the internal threshold **θ** (the default value is **0.4**).	The Q&A pair with the highest score is returned, indicating an exact match.
Case 2	The highest Q&A pair score is greater than **θ/2** but less than **θ**.	The Q&A pair with the highest score and recommended questions whose scores are higher than **θ/3** are returned (recommended questions are returned without answers).
Case 3	The highest Q&A pair score is greater than **θ/3** but less than **θ/2**.	Recommended questions whose scores are **θ/3** to **θ/2** are returned.

Example 1

```
{
    "request_id": "303a0a00-c88a",
    "question": "What should I do If I cannot open my cloud desktop?",
    "answers": [
        {
            "qa_pair_id":"123",
            "st_question":"Why does my cloud desktop fail to be opened?",
            "answer":"Incorrect user account.",
            "top_score_question":"Why does my cloud desktop fail to be opened?",
            "score":0.952,
            "domain":"Cloud desktop"
        }
    ]
}
```

Example 2

```
{
    "request_id": "303a0a00-c88a",
    "question": "What should I do If I cannot open my cloud desktop?",
    "answers": [
        {
            "qa_pair_id":"123",
            "st_question":"Why does my cloud desktop fail to be opened?",
            "top_score_question":"Why does my cloud desktop fail to be opened?",
            "answer":"Incorrect user account.",
            "score":0.352,
            "domain":"Cloud desktop"
        }
    {
            "qa_pair_id":"123",
            "st_question":"Why would my desktop fail to be opened?",
            "score":0.301,
            "domain":"Cloud desktop"
        },
        {
```

```
            "qa_pair_id":"123",
            "st_question":"What is cloud desktop?",
            "score":0.252,
            "domain":"Cloud desktop"
        }
    ]
}
```

Example 3

```
{
    "request_id": "303a0a00-c88a",
    "question": "What should I do If I cannot open my cloud desktop?",
    "answers": [
    {
            "qa_pair_id":"123",
            "st_question":"Why would my desktop fail to be opened?",
            "score":0.291,
            "domain":"Cloud desktop"
        },
        {
            "qa_pair_id":"123",
            "st_question":"What is cloud desktop?",
            "score":0.252,
            "domain":"Cloud desktop"
        }
    ]
}
```

3. Have chit-chat or ask a question without a matched answer.

```
{
    "request_id": "303a0a00-c88a",
    "question": "Hello",
    "answers": [
    {
            "answer": "Hello. May I help you?"

        }
    ]
}
```

- Failed example response

```
{
  "error_code": "CBS.0022",
  "error_msg": "session_id can not be null"
}
```

- **Evaluating Q&A satisfaction**

  You can give satisfaction evaluation for the answer returned by QABot through the API. Currently, values **1** and **-1** are available. Value **1** indicates that the answer is satisfying, and value **-1** indicates that the answer is not satisfying.

  Example code for Q&A satisfaction evaluation is as follows:

  – Example request

```
POST https://{endpoint}/v1/1604d8170cd84440a81281e5a3a04f8b/qabots/303a0a00-c88a-43e3-aa2f-d5b8b9832b02/requests/303a0a00-c88a/satisfaction
Request Header:
Content-Type: application/json
X-Auth-Token:
MIINRwYJKoZIhvcNAQcCoIINODCCDTQCAQExDTALBglghkgBZQMEAgEwgguVBgkqhkiG...
Request Body:
{
    "degree":1
}
```

  – Example response

- Successful example response

```
{
    "request_id":"303a0a00-c88a",
    "updated_time":"2017-02-07T17:34:02Z"
}
```

- Failed example response

```
{
  "error_code": "CBS.0099",
  "error_msg": "request body invalid."
}
```

2.2.3 Viewing the Q&A Dashboard

You can improve user experience by periodically viewing the statistics and operational data of Q&A bots, and propose solutions, such as adding Q&A pairs to the knowledge base. CBS allows you to view Q&A statistics on the **Dashboard** page.

To access the **Dashboard** page, log in to the CBS console and click **Question Answering Bot** in the left navigation pane. In the Q&A bot list, click the bot ID or the **Manage Bot** button in the **Operation** column. Choose **Operational Panel** > **Dashboard**.

The following functions are included:

- **Q&A Statistics**
- **Access Statistics**
- **Hot Questions**
- **Keywords**

NOTE

Q&A Statistics only displays Q&A data of the last three months.

Q&A Statistics

The **Q&A Statistics** page provides Q&A statistics of a Q&A bot. You can view statistics by time period, for example, **Daily**, **Weekly**, **Monthly**, **Last 1 day**, **Last 1 week**, and **Last 1 month**. You can also specify the target time range using the time frame.

As shown in **Figure 2-5**, Q&A statistics are displayed in terms of the following aspects:

- **Q&A Ratio**

  Q&A types are classified into the following: **Hit Questions**, **Recommended Questions**, **Chit-Chat**, and **Default Replies**. This area displays the number of times and ratio each category of Q&A is returned in a pie chart.

  – **Hit Questions**: questions raised by users that are the same as questions in the knowledge base. In this case, the answers are directly returned.

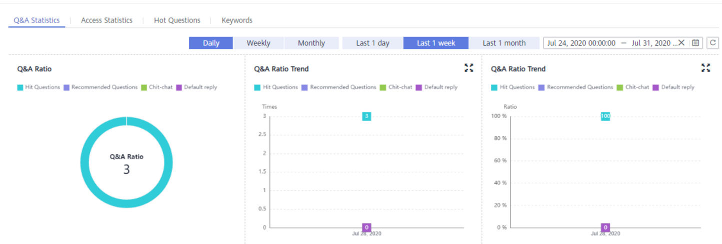
  – **Recommended Questions**: questions raised by users that match multiple questions in the knowledge base. In this case, all recommended questions are returned for users to further clarify.

  - **Chit-Chat**: questions raised by users that match chit-chat questions in the knowledge base. In this case, the answers of chit-chat questions are returned.
  - **Default Replies**: default answers the bot replies with when it cannot understand users' questions.
- **Q&A Count Trend**

  This area displays the Q&A count in a line chart for a specified time range.
- **Q&A Ratio Trend**

  This area displays the Q&A ratio trend in a line chart for a specified time range.

Figure 2-5 Q&A statistics



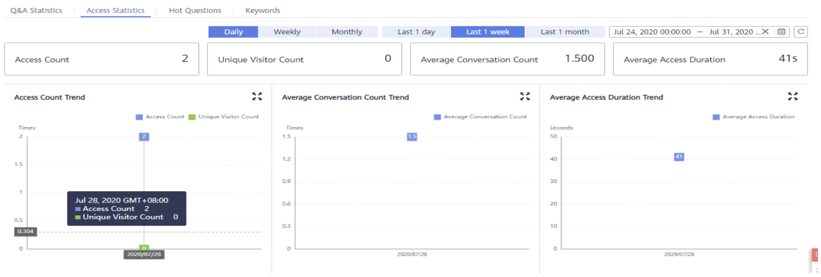
Access Statistics

The **Access Statistics** page provides statistics about users' access to and usage of a Q&A bot. You can view statistics by time period, for example, **Daily**, **Weekly**, **Monthly**, **Last 1 day**, **Last 1 week**, and **Last 1 month**. You can also specify the target time range using the time frame.

As shown in **Figure 2-6**, access statistics are displayed in terms of the following aspects:

- **Access Count**: number of sessions between users and a Q&A bot within a specified time range. Each time the bot is activated is an instance of access.
- **Unique Visitor Count**: number of users accessing the Q&A bot within a specified time range.
- **Average Conversation Count**: average number of sessions between each user and the Q&A bot within a specified time range, which is calculated using the following formula: Total number of Q&A times between users and the Q&A bot/Total number of times users accessing the Q&A bot within a specified time range.
- **Average Access Duration**: average access duration of each user within a specified time range, which is expressed by seconds and calculated using the following formula: Total time duration of user access to the Q&A bot/Number of users accessing the Q&A bot within a specified time range.
- **Access Count Trend**: data trend of the total access quantity and unique visitor quantity within a specified time range in a line chart.
- **Average Conversation Count Trend**: average number of conversations within a specified time range in a line chart.
- **Average Access Duration Trend**: average access duration within a specified time range in a line chart.

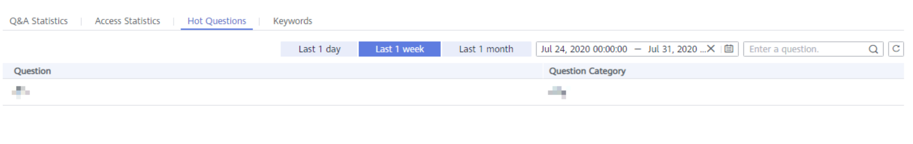
Figure 2-6 Access statistics



Hot Questions

Hot questions refer to the questions that are most frequently hit in the knowledge base within a specified time range. You can view statistics by time period, for example, **Last 1 day**, **Last 1 week**, and **Last 1 month**. You can also specify the target time range using the time frame.

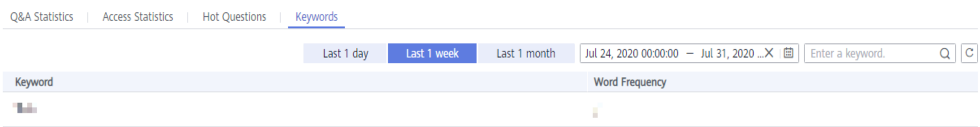
Figure 2-7 Hot questions



Keywords

The **Keywords** page displays the keywords that most frequently occur in user questions within a specified time range. You can view statistics by time period, for example, **Last 1 day**, **Last 1 week**, and **Last 1 month**. You can also specify the target time range using the time frame.

Figure 2-8 Keywords



2.2.4 Viewing Session Analysis

You can improve user experience by periodically viewing the statistics and operational data of Q&A bots, and propose solutions, such as adding Q&A pairs to the knowledge base. CBS allows you to view the session analysis to solve problems that occur during the dialog on the **Session Analysis** page.

To access the **Session Analysis** page, log in to the CBS console and click **Question Answering Bot** in the left navigation pane. In the Q&A bot list, click the bot ID or the **Manage Bot** button in the **Operation** column. Choose **Operational Panel** > **Session Analysis**.

The following functions are included on this page:

- **Session Logs**
- **Unresolved Questions**

Session Logs

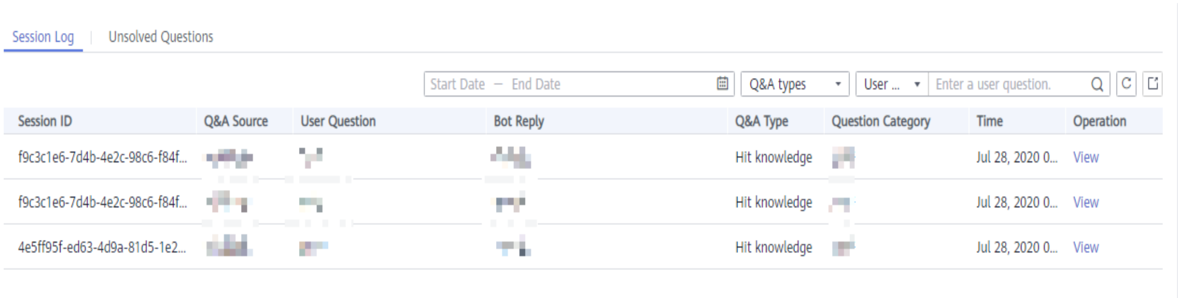
The **Session Logs** page displays all logs generated by the bot in scenarios such as dialog experience and API calling. You can filter session logs by date, Q&A type, user question, or session ID. You can view the JSON format of a specified question. The Q&A types include the following:

- **Hit question**: The Q&A bot directly returns an answer.
- **Recommended question**: The Q&A bot returns recommended questions.
- **Default reply**: The Q&A bot returns a default reply when it fails to recognize the user question.
- **Chit-chat**: The Q&A bot returns a chit-chat answer.

After a Q&A bot operates for a certain period of time, CBS records detailed logs including user questions and answers returned by the Q&A bot so that the administrator can check the Q&A bot performance in real time.

Figure 2-9 lists the Q&A logs recorded by the system.

Figure 2-9 Q&A logs



NOTE

Only data of the last three months is saved in session logs. If you want to save the data permanently, click  in the upper right corner to export the filtering result and save it locally.

Unresolved Questions

The Q&A bot automatically sorts unresolved user questions, clusters similar questions, and displays the occurrence frequencies of questions. You can sort questions based on their occurrence frequencies. In addition, you can filter and search for questions by time, operation status, question type, and question keyword, and then solve the questions. You are advised to periodically handle unresolved questions to improve Q&A performance.

- Unresolved question types include:
  - **No answer**: The Q&A bot returns a default reply set when it fails to recognize the user question.

  - **Unsatisfied**: The bot returns an answer that the user is not satisfied with.
  - **Recommended**: The bot cannot directly return an answer but returns recommended questions.
- Closed-loop operations include:
  - **Add Q&A Pair**: adds specified questions to the knowledge base.
    i. Locate the row where the target unsolved question resides and click **Add Q&A Pair** in the **Operation** column.
    ii. On the **Add Q&A Pair** page, select a question category and enter answers based on service requirements.
    iii. Click **OK**. The newly added Q&A pair is displayed in the list on the **Knowledge Base** page.
  - **Associate Existing Q&A Pair**: associates a specified question with a similar question.
    i. Locate the row where the target unsolved question resides and click **More** > **Associate Existing Q&A Pair**.
    ii. In the displayed **Associate Existing Q&A Pair** dialog box, enter the keyword of a question in the search text box to search for the corresponding Q&A pair and then select it.
    iii. Click **OK**.
  - **Ignore**: ignores the question.

2.2.5 (Optional) Advanced Settings

In the **Advanced Settings** area, you can configure advanced functions of the bot, such as bot settings.

To access the advanced settings function, log in to the CBS console and click **Question Answering Bot** in the left navigation pane. In the Q&A bot list, click the bot ID or the **Manage Bot** button in the **Operation** column. From the left navigation tree, click **Advanced Settings**.

The following functions are included:

- **Bot Settings**
- **Managing Tags**

Bot Settings

1. Configure the basic information of the bot. Your Q&A bot can reply to customers with your settings when customers ask about the bot information.
2. After the setting is complete, you can click **Start Dialog** in the upper right corner of the page to test your bot setting.

Managing Tags

This function helps you filter different answers of a question for different customers. For example, if question *X* has two answers, a and b, you can set tags to make customer A see answer a and customer B see answer b.

After setting tags on the **Tags** page, you can select a tag from the drop-down list when adding Q&A pairs to the knowledge base.

To create tags, click **Create**.