Log Tank Service

User Guide

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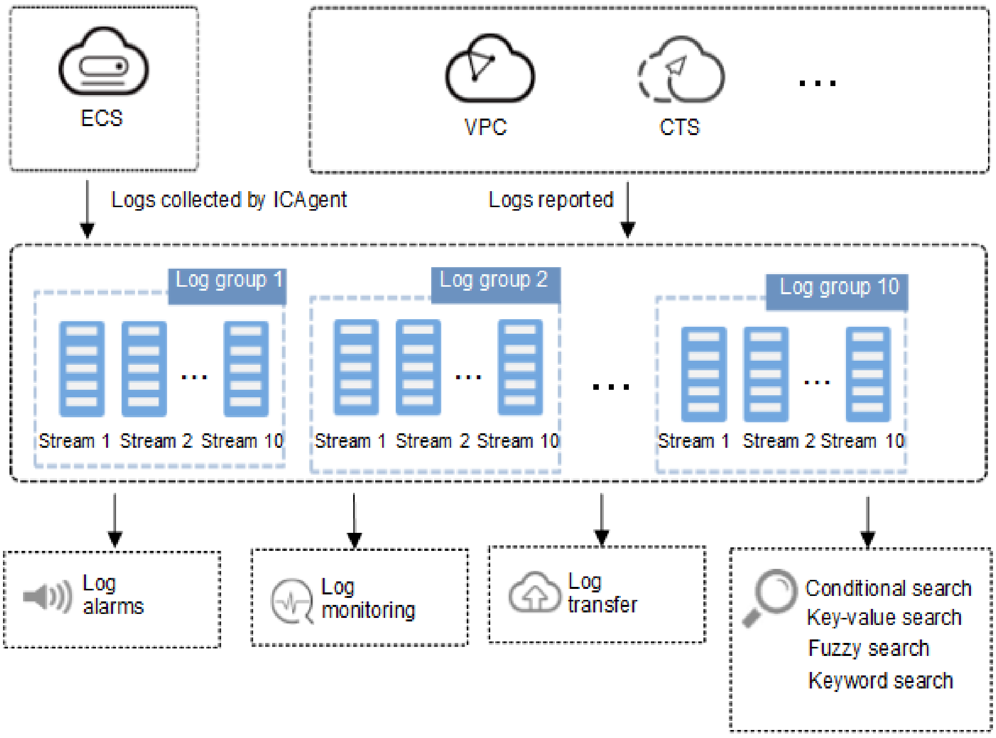
Contents

1 Service Overview

1.1 What Is LTS?

Log Tank Service (LTS) collects log data from hosts and cloud services. By processing a massive number of logs efficiently, securely, and in real time, LTS provides useful insights for you to optimize the availability and performance of cloud services and applications. It also helps you efficiently perform real-time decision-making, device O&M management, and service trend analysis.

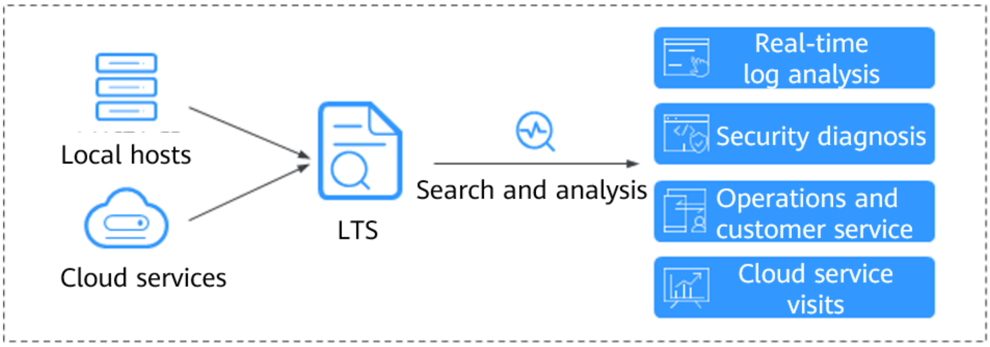
Figure 1-1 How LTS works



Log Collection and Analysis

LTS collects logs from hosts and cloud services, and displays them on the LTS console in an intuitive and orderly manner. You can transfer logs for long-term storage. Collected logs can be quickly queried by keyword or fuzzy match. You can analyze real-time logs for security diagnosis and analysis, or obtain operations statistics, such as cloud service visits and clicks.

Figure 1-2 Log collection and analysis



1.2 Basic Concepts

Log Groups

A log group is the basic unit for LTS to manage logs. You can query and transfer logs in log groups.

Log Streams

A log stream is the basic unit for log reads and writes.

You can sort logs of different types, such as operation logs and access logs, into different log streams. ICAgent will package and send the collected logs to LTS on a log stream basis. It makes it easier to find specific logs when you need them.

The use of log streams greatly reduces the number of log reads and writes and improves efficiency.

ICAgent

ICAgent is the log collection tool of LTS. If you want to use LTS to collect logs from a host, you need to install ICAgent on the host. Batch ICAgent installation is supported if you want to collect logs from multiple hosts. After ICAgent installation, you can check the ICAgent status on the LTS console in real time.

1.3 Features

Real-time Log Collection

You can view real-time logs to keep track of the status of the services connected to LTS. You can also pre-view logs.

Log Query and Real-Time Analysis

You can set search criteria to filter reported logs for fault diagnosis and system tracking. This enables easier device O&M and service trend analysis.

Log Transfer

Reported logs are retained in LTS for 7 days by default. Retained logs are deleted once the period is over. For long-term storage, you can transfer logs to Object Storage Service (OBS) buckets.

1.4 Usage Restrictions

This section describes the restrictions on LTS log read/write.

Table 1-1 Log read/write restrictions

Scope	Item	Description	Remarks
Account	Log write traffic	Logs can be written at up to 5 MB/s in an account.	To increase the upper limit, contact technical support engineers.
	Log writes	Logs can be written up to 1,000 times per second in an account.	To increase the upper limit, contact technical support engineers.
	Log query traffic	Up to 1 MB of logs can be returned in a single API query for an account.	To increase the upper limit, contact technical support engineers.

Scope	Item	Description	Remarks
	Log reads	Logs can be read up to 100 times per minute in an account.	To increase the upper limit, contact technical support engineers.
Log group	Log write traffic	Logs can be written at up to 5 MB/s in a log group.	Not mandatory. Service quality cannot be ensured if this limit is exceeded.
	Log writes	Logs can be written up to 100 times per second in a log group.	Not mandatory. Service quality cannot be ensured if this limit is exceeded.
	Log query traffic	Up to 10 MB of logs can be returned in a single API query for a log group.	N/A
	Log reads	Logs can be read up to 50 times per minute in a log group.	Not mandatory. Service quality cannot be ensured if this limit is exceeded.
Log stream	Log write traffic	Logs can be written at up to 5 MB/s in a log stream.	Not mandatory. Service quality cannot be ensured if this limit is exceeded.
	Log writes	Logs can be written up to 50 times per second in a log stream.	Not mandatory. Service quality cannot be ensured if this limit is exceeded.
	Log query traffic	Up to 10 MB of logs can be returned in a single API query for a log stream.	N/A

Scope	Item	Description	Remarks
	Log reads	Logs can be read up to 10 times per minute in a log stream.	Not mandatory. Service quality cannot be ensured if this limit is exceeded.
	Log time	Logs in a period of 24 hours can be collected. Logs generated 24 hours before or after the current time cannot be collected.	N/A

1.5 Permissions Management

Description

If you need to assign different permissions to employees in your enterprise to access your LTS resources, Identity and Access Management (IAM) is a good choice for fine-grained permissions management. IAM provides identity authentication, permissions management, and access control, helping you secure access to your LTS resources.

With IAM, you can use your account to create IAM users for your employees, and assign permissions to the users to control their access to LTS resources. For example, some software developers in your enterprise need to use LTS resources but should not delete them or perform other high-risk operations. In this case, you can create IAM users for the software developers and grant them only the permissions required.

If your account does not need individual IAM users for permissions management, you may skip over this section.

IAM can be used for free. You pay only for the resources in your account. For more information about IAM, see section "Service Overview" in the *Identity and Access Management User Guide*.

LTS Permissions

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

LTS is a project-level service deployed and accessed in specific physical regions. To assign LTS permissions to a user group, specify the scope as region-specific projects and select projects for the permissions to take effect. If **All projects** is selected, the permissions will take effect for the user group in all region-specific projects. When accessing LTS, the users need to switch to a region where they have been authorized to use LTS.

Policies: A type of fine-grained authorization mechanism that defines permissions required to perform operations on specific cloud resources under certain conditions. This mechanism allows for more flexible policy-based authorization, meeting requirements for secure access control. For example, you can grant Elastic Cloud Server (ECS) users only the permissions for managing a certain type of ECSs. Most policies define permissions based on APIs.

The system permissions supported by LTS are listed in **Table 1-2**.

Table 1-2 LTS system permissions

Name	Description	Type	Dependency
LTS FullAccess	Full permissions for LTS. Users with these permissions can perform operations on LTS.	System-defined policy	CCE Administrator, OBS Administrator, and AOM FullAccess
LTS ReadOnlyAccess	Read-only permissions for LTS. Users with these permissions can only view LTS data.	System-defined policy	CCE Administrator, OBS Administrator, and AOM FullAccess
LTS Administrator	Administrator permissions for LTS.	System-defined role	This role is dependent on the **Tenant Guest** and **Tenant Administrator** roles.

Table 1-3 lists the common operations supported by each system-defined policy and role of LTS. Choose the appropriate policies and roles according to this table.

Table 1-3 Common operations supported by each LTS system policy or role

Operation	LTS FullAccess	LTS ReadOnlyAccess	LTS Administrator
Querying a log group	√	√	√
Creating a log group	√	×	√
Modifying a log group	√	×	√
Deleting a log group	√	×	√

Operation	LTS FullAccess	LTS ReadOnlyAccess	LTS Administrator
Querying a log stream	√	√	√
Creating a log stream	√	×	√
Modifying a log stream	√	×	√
Deleting a log stream	√	×	√
Configuring log collection from hosts	√	×	√
Viewing a log transfer task	√	√	√
Creating a log transfer task	√	×	√
Modifying a log transfer task	√	×	√
Deleting a log transfer task	√	×	√
Enabling a log transfer task	√	×	√
Disabling a log transfer task	√	×	√
Installing ICAgent	√	×	√
Upgrading ICAgent	√	×	√
Uninstalling ICAgent	√	×	√

To use a custom fine-grained policy, log in to IAM as the administrator and select fine-grained permissions of LTS as required.

Table 1-4 describes fine-grained permission dependencies of LTS.

Table 1-4 Fine-grained permission dependencies of LTS

Permission	Description	Dependency
lts:agents:list	List agents	None

Permission	Description	Dependency
lts:buckets:get	Get bucket	None
lts:groups:put	Put log group	None
lts:transfers:create	Create transfer	obs:bucket:PutBucketAcl obs:bucket:GetBucketAcl obs:bucket:GetEncryptionConfiguration obs:bucket:HeadBucket dis:streams:list dis:streamPolicies:list
lts:groups:get	Get log group	None
lts:transfers:put	Put transfer	obs:bucket:PutBucketAcl obs:bucket:GetBucketAcl obs:bucket:GetEncryptionConfiguration obs:bucket:HeadBucket dis:streams:list dis:streamPolicies:list
lts:resourceTags:delete	Delete resource tag	None
lts:ecsOsLogPaths:list	List ecs os logs paths	None
lts:structConfig:create	Create struct config	None
lts:agentsConf:get	Get agent conf	None
lts:logIndex:list	Get log index	None
lts:transfers:delete	Delete transfer	None
lts:regex:create	Create struct regex	None
lts:subscriptions:delete	Delete subscription	None
lts:overviewLogsLast:list	List overview last logs	None
lts:logIndex:get	Get log index	None
lts:sqlalarmrules:create	Create alarm options	None
lts:agentsConf:create	Create agent conf	None
lts:sqlalarmrules:get	Get alarm options	None
lts:datasources:batchdelete	Batch delete datasource	None
lts:structConfig:put	Update struct config	None

Permission	Description	Dependency
lts:groups:list	List log groups	None
lts:sqlalarmrules:delete	Delete alarm options	None
lts:transfers:action	Enabled transfer	None
lts:datasources:post	Post datasource	None
lts:topics:create	Create log topic	None
lts:resourceTags:get	Query resource tags	None
lts:logs:list	List logs	None
lts:subscriptions:create	Create subscription	None
lts:overviewLogsTopTopic:get	List overview top logs	None
lts:datasources:put	Put datasource	None
lts:structConfig:delete	Delete struct config	None
lts:logIndex:delete	Deleting a specified log index	None
lts:topics:delete	Delete log topics	None
lts:agentSupportedOSLogPaths:list	List agent supported os logs paths	None
lts:topics:put	Put log topic	None
lts:agentHeartbeat:post	Post agent heartbeat	None
lts:logsByName:upload	Upload logs by name	None
lts:buckets:list	List buckets	None
lts:logIndex:post	Create log index	None
lts:logContext:list	List logs context	None
lts:groups:delete	Delete log group	None
lts:resourceTags:put	Update resource tags	None
lts:structConfig:get	Get struct config	None
lts:overviewLogTotal:get	Get overview logs total	None
lts:subscriptions:put	Put subscription	None
lts:subscriptions:list	List subscription	None
lts:datasources:delete	Delete datasource	None
lts:transfersStatus:get	List transfer status	None

Permission	Description	Dependency
lts:logIndex:put	Put log index	None
lts:sqlalarmrules:put	Modify alarm options	None
lts:logs:upload	Upload logs	None
lts:agentDetails:list	List agent diagnostic log	None
lts:agentsConf:put	Put agent conf	None
lts:logstreams:list	Check logstream resources	None
lts:subscriptions:get	Get subscription	None
lts:disStreams:list	Query DIS pipe	None
lts:groupTopics:put	Create log group and log topic	None
lts:resourceInstance:list	Query resource instance	None
lts:transfers:list	List transfers	None
lts:topics:get	Get log topic	None
lts:agentsConf:delete	Delete agent conf	None
lts:agentEcs:list	List agent ecs	None
lts:indiceLogs:list	Search indiceLogs	None
lts:topics:list	List log topic	None

1.6 Privacy and Sensitive Information Protection Statement

O&M data will be displayed on the LTS console. It is recommended that you do not upload your personal or sensitive data to LTS. Encrypt such data if you need to upload it.

ICAgent Deployment

When you install ICAgent on an ECS, your AK/SK pair is required in the installation command. Before the installation, disable history collection in the ECS to protect your AK/SK pair. After the installation, ICAgent will encrypt your AK/SK pair and store it.

1.7 Related Services

The relationships between LTS and other services are described in **Table 1**.

Table 1-5 Relationships with other services

Interaction	Related Service
With Cloud Trace Service (CTS), you can record operations associated with LTS for future query, audit, and backtracking.	CTS
You can transfer logs to Object Storage Service (OBS) buckets for long-term storage, preventing log loss.	OBS
Application Operations Management (AOM) can collect site access statistics, monitor logs sent from LTS, and generate alarms.	AOM
Identity and Access Management (IAM) allows you to grant LTS permissions to IAM users under your account.	IAM

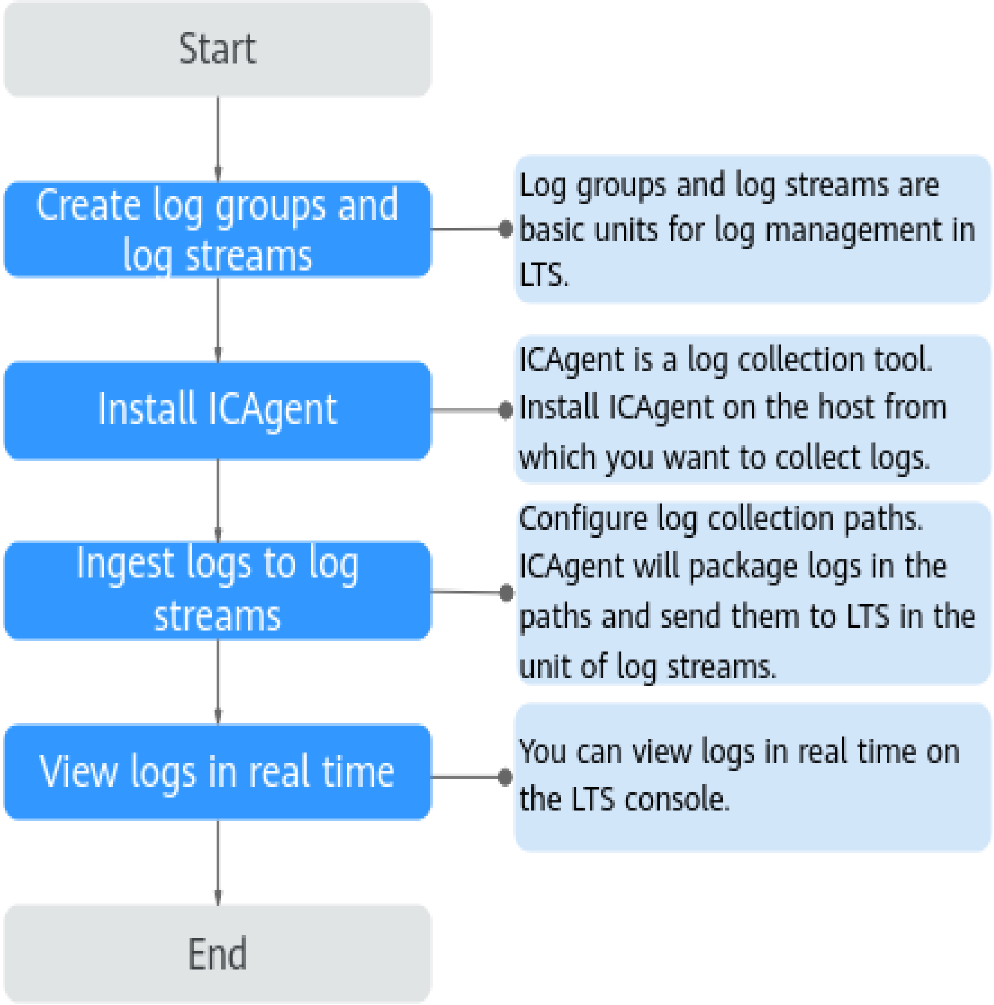
2 Getting Started

2.1 Overview

These sections use a Linux host as an example to describe log ingestion.

You will learn how to install ICAgent and quickly get started with Log Tank Service (LTS).

Figure 2-1 Flowchart


Start
Create log groups and log streams
Log groups and log streams are basic units for log management in LTS.
Install ICAgent
ICAgent is a log collection tool. Install ICAgent on the host from which you want to collect logs.
Ingest logs to log streams
Configure log collection paths. ICAgent will package logs in the paths and send them to LTS in the unit of log streams.
View logs in real time
You can view logs in real time on the LTS console.
End

2.2 Creating Log Groups and Log Streams

Log groups and log streams are basic units for log management in LTS. Before using LTS, create a log group and a log stream.

Prerequisites

You have obtained an account and its password for logging in to the console.

Creating a log group

1. Log in to the LTS console. On the **Log Management** page, click **Create Log Group**.
2. On the displayed page, set log group parameters by referring to **Table 2-1**.

Table 2-1 Log group parameters

Parameter	Description
Log Group Name	● Enter 1 to 64 characters, including only letters, digits, hyphens (-), underscores (_), and periods (.). Do not start with a period or underscore or end with a period. ● Collected logs are sent to the log group. If there are too many logs to collect, separate logs into different log groups based on log types, and name log groups in an easily identifiable way.
Log Retention Duration	Specify the number of days for retaining logs in the log group.
Tag	Tag the log group as required. Click **Add Tags**, enter a tag key and value, and enable **Apply to Log Stream**. **NOTE** ● To add more tags, repeat this step. ● To delete a tag, click 🗑 in the **Operation** column of the tag. ● A tag key can contain up to 128 characters, and a tag value can contain up to 255 characters. ● A tag key must be unique. ● If a tag is used by a transfer task, you need to modify the task configuration after deleting the tag.
Remark	Enter remarks. The value contains up to 1,024 characters.

3. Click **OK**. The created log group will be displayed in the log group list.

Creating a Log Stream

1. Click ⌄ on the left of a log group name and click **Create Log Stream**.
2. On the displayed page, set log stream parameters by referring to **Table 2-2**.

Table 2-2 Log stream parameters

Parameter	Description
Log Group Name	The name of the target log group is displayed by default.
Log Stream Name	● Enter 1 to 64 characters, including only letters, digits, hyphens (-), underscores (_), and periods (.). Do not start with a period or underscore or end with a period. ● Collected logs are sent to the created log stream. If there are a large number of logs, you can create multiple log streams and name them for quick log search.

Parameter	Description
Log Retention Duration	Specify the number of days for retaining logs in the log stream. ● If this parameter is disabled, the log stream will inherit the log retention setting of the log group. ● If this parameter is enabled, you can set the log retention duration specifically for the log stream.
Tag	Tag the log stream as required. Click **Add Tags** and enter a tag key and tag value. **NOTE** ● To add more tags, repeat this step. ● To delete a tag, click 🗑 in the **Operation** column of the tag. ● A tag key can contain up to 128 characters, and a tag value can contain up to 255 characters. ● A tag key must be unique. ● If a tag is used by a transfer task, you need to modify the task configuration after deleting the tag.
Remark	Enter remarks. The value contains up to 1,024 characters.

3. Click **OK**. The created log stream will be displayed under the target log group.

2.3 Installing ICAgent

ICAgent is the log collection tool of LTS. Install ICAgent on a host from which you want to collect logs.

If ICAgent has been installed on the host when you use other cloud services, skip the installation.

Prerequisites

Before installing ICAgent, ensure that the time and time zone of your local browser are consistent with those of the host.

Installing ICAgent

Step 1 Log in to the LTS console and choose **Host Management** in the navigation pane.

Step 2 Click **Install ICAgent** in the upper right corner.

Step 3 Set **OS** to **Linux**.

Step 4 Set **Installation Mode** to **Obtain AK/SK**.

NOTE

Ensure that the public account and AK/SK pair will not be deleted or disabled. If the AK/SK pair is deleted, ICAgent cannot report data to LTS.

Obtain and use the AK/SK pair of a public account.

The Access Key ID/Secret Access Key (AK/SK) can be obtained on the **My Credentials** page. The procedure is as follows:

1. Hover the mouse pointer over the username in the upper right corner of the page and select **My Credentials**.
2. On the **My Credentials** page, choose **Access Keys**.
3. Click **Create Access Key** and enter a description.

   NOTE

   Up to two access keys can be created for each user. An access key can be downloaded only right after it is created. If the **Create Access Key** button is grayed out, delete an access key first before creating one.
4. Click **OK**, download the AK/SK pair, and keep it secure.

Step 5 Click **Copy Command** to copy the ICAgent installation command.

Step 6 Log in as user **root** to the host (for example, by using a remote login tool such as PuTTY). Run the copied command and enter the obtained AK/SK pair to install ICAgent.

When the message **ICAgent install success** is displayed, ICAgent has been installed in the **/opt/oss/servicemgr/** directory of the host. You can then view the ICAgent status on the **Hosts** tab of the **Host Management** page on the LTS console.

----End

2.4 Step 3: Ingesting Logs to Log Streams

The following shows how you can ingest host logs to LTS.

When ICAgent is installed, configure the paths of host logs that you want to collect in log streams. ICAgent will pack logs and send them to LTS in the unit of log streams.

Prerequisites

- You have created log groups and log streams.
- You have installed ICAgent.

Procedure

Step 1 Log in to the LTS console and choose **Log Ingestion** in the navigation pane.

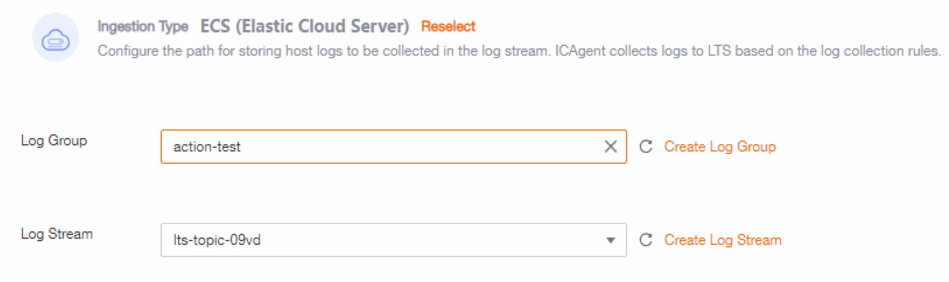
Step 2 Click **ECS (Elastic Cloud Server)** to configure log ingestion.

Step 3 Select a log stream.

1. Select a log group from the drop-down list of **Log Group**. If there are no desired log groups, click **Create Log Group** to create one.
2. Select a log stream from the drop-down list of **Log Stream**. If there are no desired log streams, click **Create Log Stream** to create one.

3. Click **Next: (Optional) Select Host Group**.

Figure 2-2 Selecting a log stream



Ingestion Type ECS (Elastic Cloud Server)

Configure the path for storing host logs to be collected in the log stream. ICAgent collects logs to LTS based on the log collection rules.

Log Group: action-test

Log Stream: lts-topic-09vd

Step 4 Select a host group.

1. In the host group list, select one or more host groups to collect logs. If there are no desired host groups, click **Create** in the upper left corner of the list. On the displayed **Create Host Group** page, create a host group. For details, see **Creating a Host Group (IP Address)**.

   NOTE

   You can choose not to select a host group in this step, but associate a host group with the ingestion configuration after you finish the procedure here. There are two options to do this:

   – Choose **Host Management** in the navigation pane, click the **Host Groups** tab, and complete the association.

   – Choose **Log Ingestion** in the navigation pane, click an ingestion configuration, and make the association on the details page.

2. Click **Next: Configurations**.

Step 5 Configure the collection.

For details, see **Configurations**.

Step 6 (Optional) Configure structured logs.

Step 7 (Optional) Configure indexes.

Step 8 Click **Submit** Click **Back to Ingestion Configurations** to check the ingestion details. You can also click **View Log Stream** to view the log stream to which logs are ingested.

----End

2.5 Step 4: Viewing Logs in Real Time

After the log ingestion is configured, you can view the reported logs on the LTS console in real time.

Prerequisites

- You have created log groups and log streams.
- You have installed ICAgent.
- You have ingested logs.

Viewing Logs in Real Time

1. Log in to the LTS console and choose **Log Management**.
2. In the log group list, click the name of the target log group.
3. Or in the log stream list, click the name of the target log stream.
4. On the log stream details page, click **Real-Time Logs** to view logs in real time.

   Logs are reported to LTS once every five seconds. You may wait for at most five seconds before the logs are displayed.

   You can control log display by clicking **Clear** or **Pause** in the upper right corner.

   – **Clear**: Displayed logs will be cleared from the real-time view.

   – **Pause**: Loading of new logs to the real-time view will be paused.

     After you click **Pause**, the button changes to **Continue**. You can click **Continue** to resume the log loading to the real-time view.

     NOTE

     Stay on the **Real-Time Logs** tab to keep updating them in real time. If you leave the **Real-Time Logs** tab, logs will stop being loaded in real time.

3 Permissions Management

This chapter describes how to use Identity and Access Management (IAM) to implement fine-grained permissions control for your LTS 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 LTS resources.
- Grant only the permissions required for users to perform a specific task.
- Create IAM users for employees based on your enterprise's organizational structure. Each IAM user will have their own security credentials for accessing LTS resources.

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

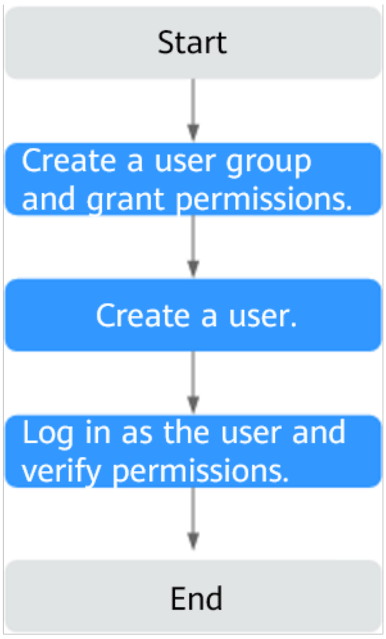
This section describes the procedure for granting permissions (see **Figure 3-1**).

Prerequisites

Before granting permissions to user groups, learn about the permissions supported by LTS and select the permissions as required. For details, see **Permissions ManagementPermissions**.

Process Flow

Figure 3-1 Process of granting permissions to a user


Start
Create a user group and grant permissions.
Create a user.
Log in as the user and verify permissions.
End

1. Log in to the IAM console. Create a user group on the IAM console and grant the **LTS FullAccess** permission to the user group. For details, see section "Creating a User Group and Assigning Permissions" in the *IAM User Guide*.

   NOTE

   If you select the **LTS FullAccess** permissions, the **Tenant Guest** policy that the permission depends on is automatically selected. You also need to grant the **Tenant Administrator** policy for the global service project to the user group.

2. Create a user on the IAM console and add the user to the user group created in 1. For details, see section "Creating a User and Adding the User to a User Group" in the *IAM User Guide*.

3. Log in to the console by using the created user and verify permissions in the authorized region. For details, see section "Logging In as a User" in the *IAM User Guide* and verify permissions.

4 Log Management

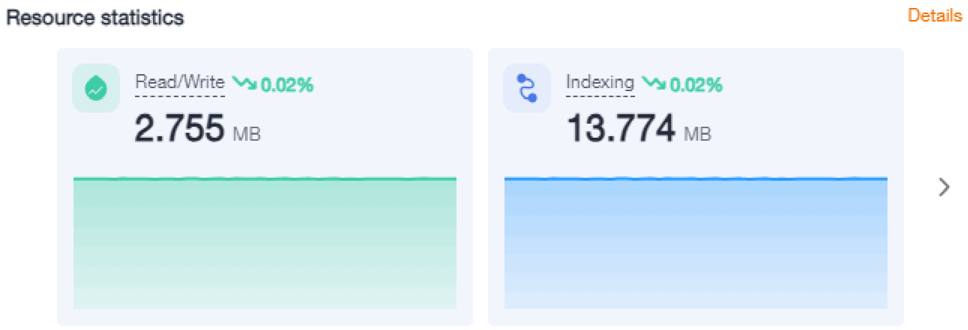
4.1 Overview

The log management page on the LTS console provides resource statistics, your favorite log streams/favorite log streams (local cache), alarm statistics, latest alarms, FAQs, and recently viewed log streams.

Resource Statistics

This area shows the read/write traffic, index traffic, log volume, and raw log traffic of the account on the previous day, as well as the day-on-day changes.

Figure 4-1 Resource statistics

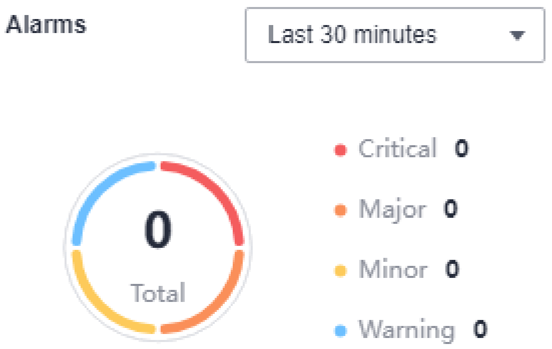


For details, see **Resource Statistics**.

Alarm Statistics

This area contains the total number of alarms in LTS and the number of alarms at each severity level. You can view alarm statistics of the last 30 minutes, last 1 hour, last 6 hours, last 1 day, or last 1 week. The alarm severity levels are **Critical**, **Major**, **Minor**, and **Warning**.

Figure 4-2 Alarm Statistics



Alarms

Last 30 minutes

Latest Alarms

This area displays a maximum of three latest alarm rules in the last 30 minutes.

To view more alarms or add alarm rules, click ⋯ .

My Favorites/My Favorites (Local Cache)

This area displays the log streams you have added to favorites, including **My Favorites** and **My Favorites (Local Cache)**.

- **My Favorites**: Save log streams to the database. This function is disabled by default. If your account has the write permission, **My Favorites** and **My Favorites (Local Cache)** are displayed.
- **My Favorites (Local Cache)**: Save log streams to the local cache of the browser. This function is disabled by default. **My Favorites (Local Cache)** is displayed for all accounts.

  NOTE

  If your account has the write permission, at least one of **My Favorites** and **My Favorites (Local Cache)** is enabled. Otherwise, log streams cannot be added to favorites.

You can customize a list of your favorite log streams for quickly locating frequently used log streams.

For example, to add a log stream of the log group **lts-test** to favorites, perform the following steps:

Step 1 Log in to the LTS console.

Step 2 In the **Log Groups** list, click ⌄ next to the log group name **lts-test**.

Step 3 Click ☆ on the right of the log stream. On the displayed **Edit** tab page, select a mode and click **OK**.

NOTE

You can remove a favorite in either of the following ways:

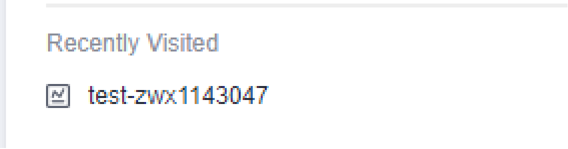
- In the log stream list, click ★ in the row containing a log stream.
- In the **My Favorites** area, hover the cursor over a log stream and click ★ .

----End

Recently Visited

This area displays the log streams that are recently visited.

Figure 4-3 Recently Visited



Recently Visited

test-zwx1143047

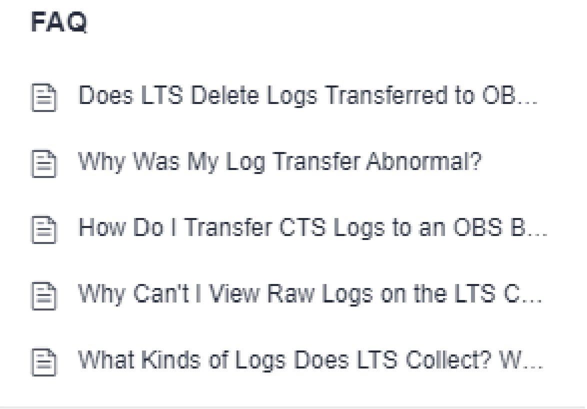
NOTE

A maximum of three log streams can be displayed in **Recently Visited**.

FAQ

This area displays frequently asked questions.

Figure 4-4 FAQ



FAQ

Does LTS Delete Logs Transferred to OB...

Why Was My Log Transfer Abnormal?

How Do I Transfer CTS Logs to an OBS B...

Why Can't I View Raw Logs on the LTS C...

What Kinds of Logs Does LTS Collect? W...

4.2 Resource Statistics

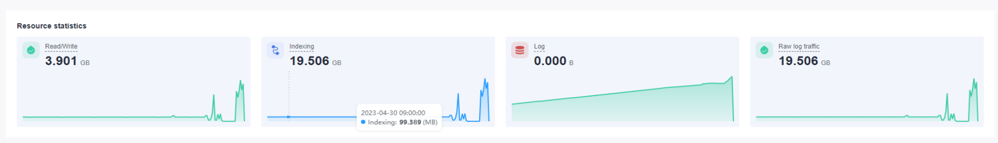
Log resource statistics are classified into read/write traffic, index traffic, log volume, and raw log traffic. The statistics are for reference only. You can also visualize log resource statistics in charts.

- **Read/Write**: LTS charges for the amount of compressed log data read from and written to LTS. Generally, the log compression ratio is 5:1.

- **Indexing**: Raw logs are full-text indexed by default for log search.
- **Log**: Space used for storing compressed logs, indexes, and copies is billed. The space is roughly the size of the raw logs.
- **Raw log traffic**: size of raw logs

Resource Statistics

Figure 4-5 Resource statistics



Resource statistics display log resource data. By default, log resource data of one week (from now) is displayed. You can select a time range as required.

There are three types of time range: relative time from now, relative time from last, and specified time. Select a time range as required.

NOTE

- **From now**: queries log data generated in a time range that ends with the current time, such as the previous 1, 5, or 15 minutes. For example, if the current time is 19:20:31 and **1 hour** is selected as the relative time from now, the charts on the dashboard display the log data that is generated from 18:20:31 to 19:20:31.
- **From last**: queries log data generated in a time range that ends with the current time, such as the previous 1 or 15 minutes. For example, if the current time is 19:20:31 and **1 hour** is selected as the relative time from last, the charts on the dashboard display the log data that is generated from 18:00:00 to 19:00:00.
- **Specified**: queries log data that is generated in a specified time range.

- The read and write traffic and index traffic data in the selected time range is displayed.
- Day-on-day changes in the selected time range are displayed. You can view the trend.
- The traffic trend chart for the selected time range is displayed. Each point in the trend chart indicates the data statistics in a certain period. The unit is KB, MB, or GB. The statistics are collected based on site requirements.

Resource Statistics Details

Resource statistics details display the top 100 log groups or log streams by read/write traffic, index traffic, and latest log volume. By default, the log groups or log streams are sorted by the latest log volume (GB). You can also sort the statistics by read/write or index traffic.

- For a new log group or log stream, resource statistics will be collected in at least one hour.
- Click the name of one of the top 100 log groups to query its log stream resource statistics.
- Click ⤓ to download the resource statistics of the target log groups and log streams.

NOTE

The downloaded resource statistics of the target log groups and log streams files are in **.CSV** format.

- You can select a time range to collect statistics on resource details.

  There are three types of time range: relative time from now, relative time from last, and specified time. Select a time range as required.

  NOTE

  - **From now**: queries log data generated in a time range that ends with the current time, such as the previous 1, 5, or 15 minutes. For example, if the current time is 19:20:31 and **1 hour** is selected as the relative time from now, the charts on the dashboard display the log data that is generated from 18:20:31 to 19:20:31.
  - **From last**: queries log data generated in a time range that ends with the current time, such as the previous 1 or 15 minutes. For example, if the current time is 19:20:31 and **1 hour** is selected as the relative time from last, the charts on the dashboard display the log data that is generated from 18:00:00 to 19:00:00.
  - **Specified**: queries log data that is generated in a specified time range.
- The daily log volume (GB), daily index traffic (GB), and daily read/write traffic (GB) are displayed based on the selected time range.

  There are two display modes:

  – Table

  – Bar chart

4.3 Log Groups

A log group is a group of log streams that share the same log retention settings. Up to 100 log groups can be created for a single account.

Prerequisites

You have obtained an account and its password for logging in to the LTS console.

Creating a Log Group

1. Log in to the LTS console. On the **Log Management** page, click **Create Log Group**.
2. On the displayed page, set log group parameters by referring to **Table 4-1**.

Table 4-1 Log group parameters

Parameter	Description
Log Group Name	• Enter 1 to 64 characters, including only letters, digits, hyphens (-), underscores (_), and periods (.). Do not start with a period or underscore or end with a period. • Collected logs are sent to the log group. If there are too many logs to collect, separate logs into different log groups based on log types, and name log groups in an easily identifiable way.

Parameter	Description
Log Retention Duration	Specify the number of days for retaining logs in the log group.
Tag	Tag the log group as required. Click **Add Tags**, enter a tag key and value, and enable **Apply to Log Stream**. **NOTE** ● To add more tags, repeat this step. ● To delete a tag, click 🗑 in the **Operation** column of the tag. ● A tag key can contain up to 128 characters, and a tag value can contain up to 255 characters. ● A tag key must be unique. ● If a tag is used by a transfer task, you need to modify the task configuration after deleting the tag.
Remark	Enter remarks. The value contains up to 1,024 characters.

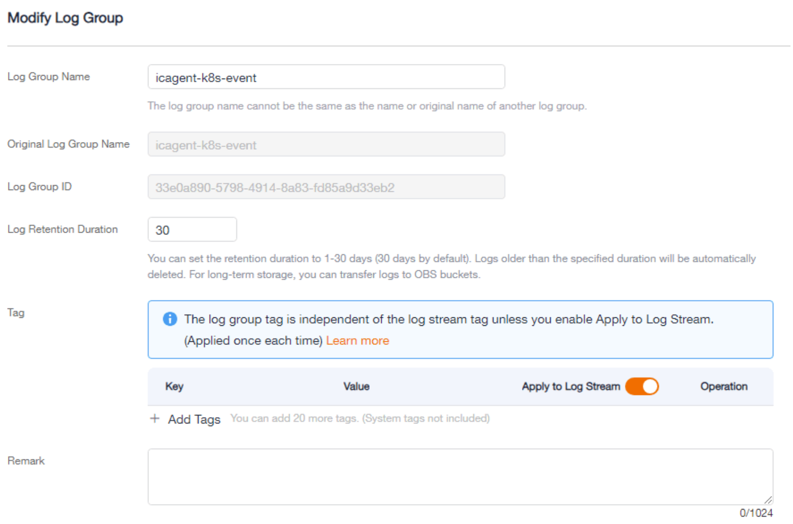
3. Click **OK**. The created log group will be displayed in the log group list.
   - In the log group list, you can view information such as the log group name, tags, and log streams.
   - Click the log group name, the details page of one of its log streams is displayed.
   - When multiple log groups are created concurrently, there may be a limit exceeding error.

Modifying a Log Group

You can modify the log name, log retention duration, or remarks of a log group by performing the following steps:

1. In the log group list, locate the target log group and click **Modify** in the **Operation** column.
2. Modify the log name and log retention duration on the displayed page.

Figure 4-6 Modifying a log group



Modify Log Group

Log Group Name: icagent-k8s-event

The log group name cannot be the same as the name or original name of another log group.

Original Log Group Name: icagent-k8s-event

Log Group ID: 33e0a890-5798-4914-8a83-fd85a9d33eb2

Log Retention Duration: 30

You can set the retention duration to 1-30 days (30 days by default). Logs older than the specified duration will be automatically deleted. For long-term storage, you can transfer logs to OBS buckets.

Tag: The log group tag is independent of the log stream tag unless you enable Apply to Log Stream. (Applied once each time) Learn more

Key	Value	Apply to Log Stream	Operation

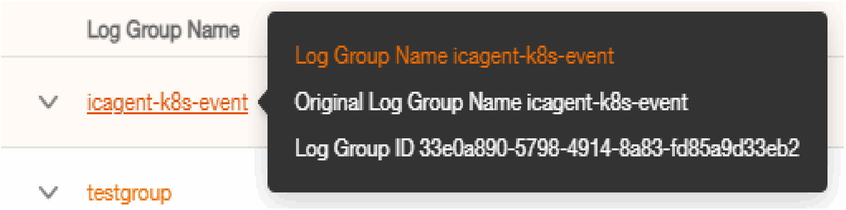
+ Add Tags You can add 20 more tags. (System tags not included)

Remark

0/1024

3. Click **OK**.
4. After the modification is successful, move the cursor over the log group name. The new and original log group names are displayed.

Figure 4-7 Log group name



Log Group Name

icagent-k8s-event

testgroup

Log Group Name icagent-k8s-event

Original Log Group Name icagent-k8s-event

Log Group ID 33e0a890-5798-4914-8a83-fd85a9d33eb2

Deleting a Log Group

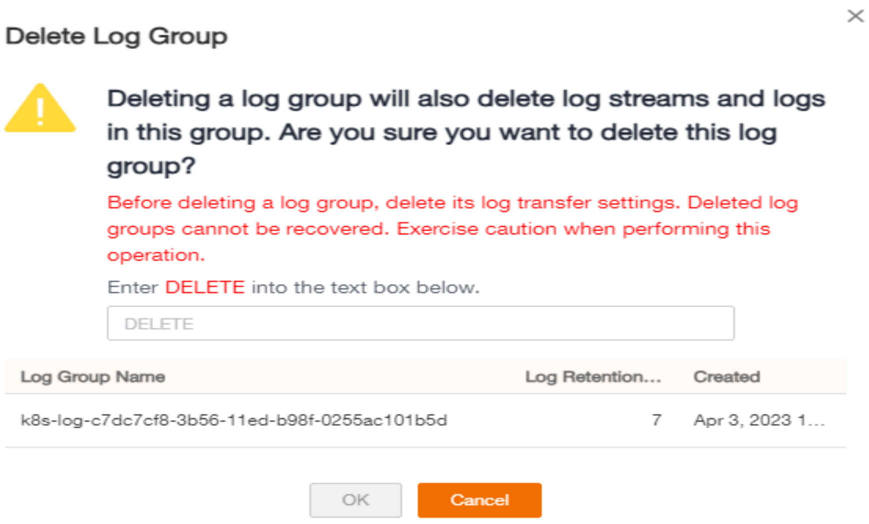
You can delete a log group that is no longer needed. Deleting a log group will also delete the log streams and log data in the log group. Deleted log groups cannot be recovered. Exercise caution when performing the deletion.

NOTE

If you want to delete a log group that is associated with a log transfer task, delete the task first.

1. In the log group list on the **Log Management** page, locate the target log group and click **Delete** in the **Operation** column.
2. Enter **DELETE** and click **OK**.

Figure 4-8 Deleting a log group



Delete Log Group

Deleting a log group will also delete log streams and logs in this group. Are you sure you want to delete this log group?

Before deleting a log group, delete its log transfer settings. Deleted log groups cannot be recovered. Exercise caution when performing this operation.

Enter DELETE into the text box below.

DELETE

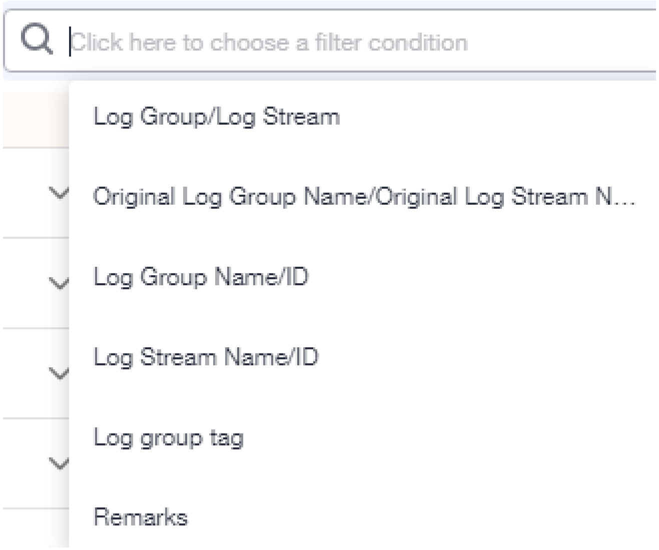
Log Group Name	Log Retention...	Created
k8s-log-c7dc7cf8-3b56-11ed-b98f-0255ac101b5d	7	Apr 3, 2023 1...

Searching Log Groups/Streams

In the log group list, click the search box and set the following filter criteria:

- Log group/stream
- Original log group/stream name
- Log group name/ID
- Log stream name/ID
- Log group tag
- Remarks

Figure 4-9 Searching log groups/streams



Click here to choose a filter condition
Log Group/Log Stream
Original Log Group Name/Original Log Stream N...
Log Group Name/ID
Log Stream Name/ID
Log group tag
Remarks

Other Operations

To view the details of a log group, go to the log group list and click **Details** in the **Operation** column of the desired log group, including the log group name, ID, and creation time.

Click ⤓ next to the search box to download all displayed information about the log group to the local PC.

4.4 Log Streams

A log stream is the basic unit for reading and writing logs. You can separate different types of logs (such as operation logs and access logs) into different log streams for easier management. Sorting logs into different log streams makes it easier to find specific logs when you need them.

Up to 100 log streams can be created in a log group. The upper limit cannot be increased. If you cannot create a log stream because the upper limit is reached, you are advised to delete log streams that are no longer needed and try again, or create log streams in a new log group.

Prerequisites

You have created a log group.

Creating a Log Stream

1. On the LTS console, click ⌄ on the left of a log group name.
2. Click **Create Log Stream**. On the displayed page, set log stream parameters by referring to **Table 4-2**.

Table 4-2 Log stream parameters

Parameter	Description
Log Group Name	The name of the target log group is displayed by default.
Log Stream Name	● Enter 1 to 64 characters, including only letters, digits, hyphens (-), underscores (_), and periods (.). Do not start with a period or underscore or end with a period. ● Collected logs are sent to the created log stream. If there are a large number of logs, you can create multiple log streams and name them for quick log search.

Parameter	Description
Log Retention Duration	Specify the number of days for retaining logs in the log stream. ● If this parameter is disabled, the log stream will inherit the log retention setting of the log group. ● If this parameter is enabled, you can set the log retention duration specifically for the log stream.
Tag	Tag the log stream as required. Click **Add Tags** and enter a tag key and tag value. **NOTE** ● To add more tags, repeat this step. ● To delete a tag, click 🗑 in the **Operation** column of the tag. ● A tag key can contain up to 128 characters, and a tag value can contain up to 255 characters. ● A tag key must be unique. ● If a tag is used by a transfer task, you need to modify the task configuration after deleting the tag.
Remark	Enter remarks. The value contains up to 1,024 characters.

3. Click **OK**. In the log stream list, you can view information such as the log stream name and operations.

Modifying a Log Stream

By default, a log stream inherits the log retention setting from the log group it belongs to.

1. In the log stream list, locate the target log stream and click ✎ in the **Operation** column.
2. In the dialog box displayed, modify the log stream name and log retention duration.

   NOTE

   - If you disable **Log Retention Duration**, the log stream will inherit the log retention setting of the log group.
   - If you enable **Log Retention Duration**, you can set the log retention duration specifically for the log stream.
   - The logs that exceed the retention period will be deleted automatically. You can transfer logs to OBS buckets for long-term storage.
   - For details about how to add a tag, see **Tag Management**.
3. Click **OK**.
4. After the modification is successful, move the cursor over the log stream name. The new and original log stream names are displayed.

Deleting a Log Stream

You can delete a log stream that is no longer needed. Deleting a log stream will also delete the log data in the log stream. Deleted log streams cannot be recovered. Exercise caution when performing the deletion.

> **NOTE**
>
> - Before deleting a log stream, check whether any log collection task is configured for it. If there is a log collection task, deleting the log stream may affect log reporting.
> - If you want to delete a log stream that is associated with a log transfer task, delete the task first.

1. In the log stream list, locate the target log stream and click 🗑 in the **Operation** column.
2. Enter **DELETE** and click **OK**.

Other Operations

- Adding a log stream to favorites

  Click ☆ in the **Operation** column of a log stream to add the log stream to favorites. The log stream is then displayed in **My Favorites**/**My Favorites (Local Cache)** on **the console homepage**.
- **Details**

  Click 💬 in the **Operation** column of a log stream to view its details, including the log stream name, log stream ID, and creation time.

4.5 Tag Management

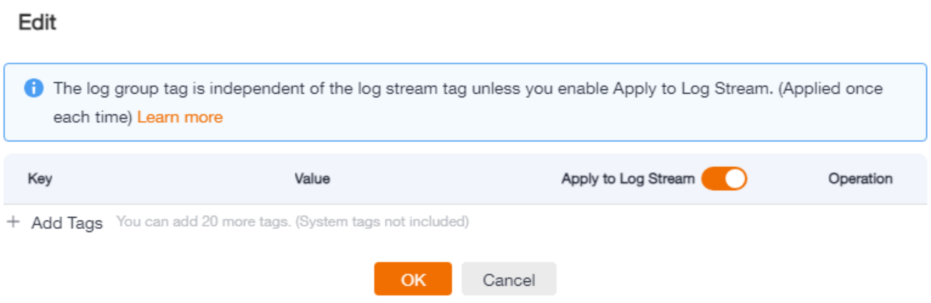
You can tag log groups, log streams, host groups, and log ingestion configurations.

Tagging a Log Group

Users can add, delete, modify, and query tags on the log group page.

1. Log in to the LTS console, and choose **Log Management** in the navigation pane on the left.
2. Move the cursor to the **Tags** column of the target log group and click ✎.
3. On the **Edit** page that is displayed, click **Add Tags** and enter a tag key and value. If you enable **Apply to Log Stream**, the tag will be synchronized to all log streams in the log group.

Figure 4-10 Editing a tag



Edit

The log group tag is independent of the log stream tag unless you enable Apply to Log Stream. (Applied once each time) Learn more

Key	Value	Apply to Log Stream	Operation

+ Add Tags You can add 20 more tags. (System tags not included)

OK Cancel

NOTE

- To add multiple tags, repeat this step.
- To delete a tag, click 🗑 in the **Operation** column of the tag.
- A tag key can contain up to 128 characters, and a tag value can contain up to 255 characters.
- A tag key must be unique.
- If a tag is used by a transfer task, you need to modify the task configuration after deleting the tag.

4. Click **OK**.

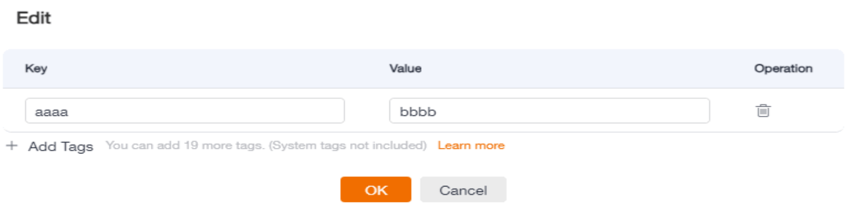
   On the **Log Management** page, you can view the added tags in the **Tags** column of the log group.

Tagging a Log Stream

You can add, delete, modify, and view tags on the log stream list page. When you manage the tags of a single log stream, the changes will not be synchronized to other streams.

1. Log in to the LTS console, and choose **Log Management** in the navigation pane on the left.
2. Click ∨ in front of the name of the target log group.
3. Move the cursor to the **Tags** column of the target log stream and click ✎.
4. On the **Edit** page that is displayed, click **Add Tags** and enter a tag key and value.

Figure 4-11 Editing a tag



Edit

Key	Value	Operation
aaaa	bbbb	🗑

+ Add Tags You can add 19 more tags. (System tags not included) Learn more

OK Cancel

NOTE

- To add multiple tags, repeat this step.
- To delete a tag, click 🗑 in the **Operation** column of the tag.
- A tag key can contain up to 128 characters, and a tag value can contain up to 255 characters.
- A tag key must be unique.
- If a tag is used by a transfer task, you need to modify the task configuration after deleting the tag.

5. Click **OK**.

   In the log stream list, you can view the system tags and added custom tags in the **Tags** column of the log stream.

Tagging a Host Group

You can add, delete, modify, and view tags on the host group list page. When you manage the tags of a single host group, the changes will not be synchronized to other groups.

1. Log in to the LTS console, and choose **Host Management** in the navigation pane on the left.
2. On the **Host Groups** tab, click 🗒 in the **Operation** column of a host group.
3. On the **Edit** page that is displayed, click **Add Tags** and enter a tag key and value.

   NOTE

   - To add multiple tags, repeat this step.
   - To delete a tag, click 🗑 in the **Operation** column of the tag.
   - A tag key can contain up to 128 characters, and a tag value can contain up to 255 characters.
   - A tag key must be unique.
4. Click **OK**.

   On the **Host Management** page, you can view the added tags in the **Tags** column of the host group.

Tagging a Log Ingestion Configuration

You can add, delete, modify, and view tags on the log ingestion page. When you manage the tags of a single log ingestion configuration, the changes will not be synchronized to other configurations.

1. Log in to the LTS console, and choose **Log Ingestion** in the navigation pane on the left.
2. Click **Configure Tag** in the **Operation** column of a log ingestion configuration.
3. On the **Edit** page that is displayed, click **Add Tags** and enter a tag key and value.

NOTE

- To add multiple tags, repeat this step.
- To delete a tag, click 🗑 next to the tag in the text box.
- A tag key can contain up to 128 characters, and a tag value can contain up to 255 characters.
- A tag key must be unique.

4. Click **OK**.

   On the **Log Ingestion** page, you can view the added tags in the **Tags** column of the log ingestion configuration.

5 Log Ingestion

5.1 Collecting Logs from Cloud Services

5.1.1 Ingesting CCE Application Logs to LTS

LTS can collect logs from CCE.

Prerequisites

- ICAgent has been installed in the CCE cluster and a host group with custom identifiers has been created for related nodes. If ICAgent has not been installed, upgrade it on the **Host Management** page. For details, see **Upgrading ICAgent**.
- You have **disabled** **Output to AOM**.

Restrictions

- CCE cluster nodes whose container engine is Docker are supported.
- CCE cluster nodes whose container engine is Containerd are supported. You must be using ICAgent 5.12.130 or later.
- To collect container log directories mounted to host directories to LTS, you must configure the node file path.
- Restrictions on the Docker storage driver: Currently, container file log collection supports only the overlay2 storage driver. devicemapper cannot be used as the storage driver. Run the following command to check the storage driver type:
  ```
  docker info | grep "Storage Driver"
  ```
- If you select **Fixed log stream** for log ingestion, ensure that you have created a CCE cluster.

Procedure

Perform the following operations to configure CCE log ingestion:

Step 1 Log in to the LTS console.

Step 2 In the navigation pane, choose **Log Ingestion**. Click **CCE (Cloud Container Engine)**.

Step 3 Alternatively, choose **Log Management** in the navigation pane. Click the name of the target log stream to go to the log details page. Click ⚙ in the upper right corner. On the displayed page, click the **Collection Configuration** tab and click **Create**. In the displayed dialog box, click **CCE (Cloud Container Engine)**.

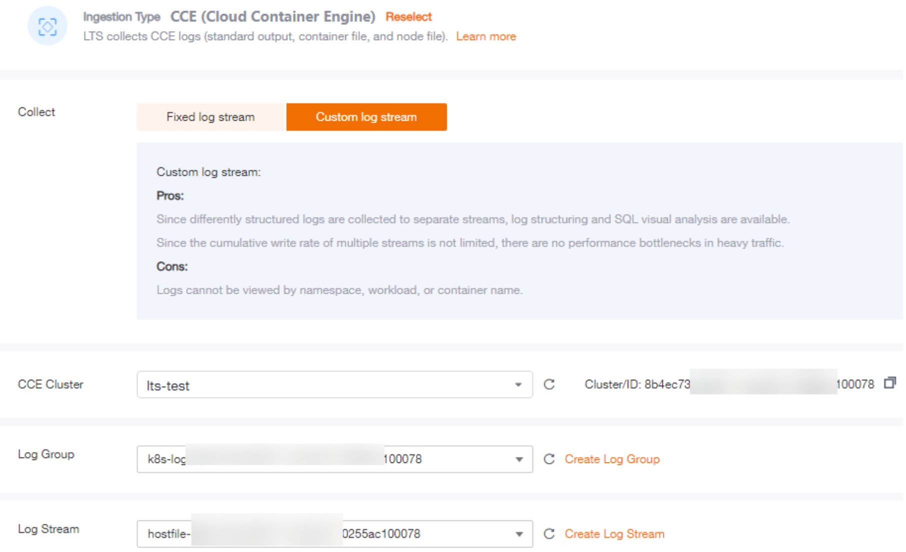
Step 4 Select a log stream.

Choose between **Custom log stream** and **Fixed log stream** to suite your requirements.

Custom log stream

1. Select a cluster from the **CCE Cluster** drop-down list.
2. Select a log group from the **Log Group** drop-down list. If there are no desired log groups, click **Create Log Group** to create one.
3. Select a log stream from the **Log Stream** drop-down list. If there are no desired log streams, click **Create Log Stream** to create one.
4. Click **Next: Check Dependencies**.

Figure 5-1 Custom log stream



Ingestion Type CCE (Cloud Container Engine) Reselect
LTS collects CCE logs (standard output, container file, and node file). Learn more

Collect: Fixed log stream | Custom log stream

Custom log stream:
Pros:
Since differently structured logs are collected to separate streams, log structuring and SQL visual analysis are available.
Since the cumulative write rate of multiple streams is not limited, there are no performance bottlenecks in heavy traffic.
Cons:
Logs cannot be viewed by namespace, workload, or container name.

CCE Cluster: lts-test — Cluster/ID: 8b4ec73[redacted]100078

Log Group: k8s-log[redacted]100078 — Create Log Group

Log Stream: hostfile-[redacted]0255ac100078 — Create Log Stream

Fixed log stream

Logs will be collected to a fixed log stream. The default log streams of CCE clusters: **stdout-***{ClusterID}* for standard output/errors, **hostfile-***{ClusterID}* for node files, **event-***{ClusterID}* for Kubernetes events, and **containerfile-***{ClusterID}* for container files. Log streams are automatically named with a cluster ID. For example, if the cluster ID is **Cluster01**, the standard output/error log stream is **stdout-Cluster01**.

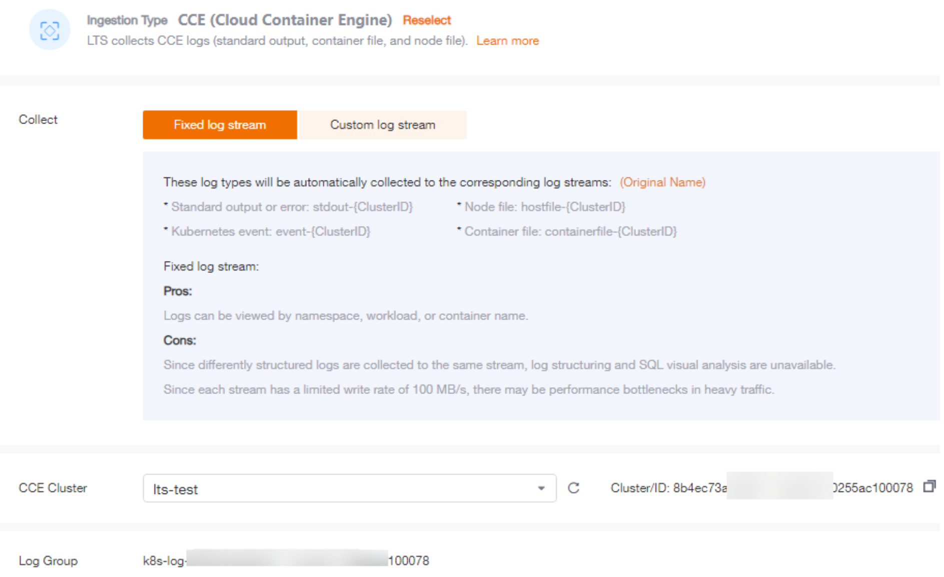
Log streams that can be created for a CCE cluster are **stdout-***{ClusterID}* for standard output/errors, **hostfile-***{ClusterID}* for node files, **event-***{ClusterID}* for Kubernetes events, and **containerfile-***{ClusterID}* for container files. If one of them has been created in a log group, the log stream will no longer be created in the same log group or other log groups.

1. Select a cluster from the **CCE Cluster** drop-down list.
2. The default log group is **k8s-log-***ClusterID*. For example, if the cluster ID is **c7f3f4a5-bcb8-11ed-a4ec-0255ac100b07**, the default log group will be **k8s-log-c7f3f4a5-bcb8-11ed-a4ec-0255ac100b07**.

   NOTE

   If there is no such group, the system displays the following message: This log group does not exist and will be automatically created to start collecting logs.
3. Click **Next: Check Dependencies**.

Figure 5-2 Fixed log stream



Ingestion Type CCE (Cloud Container Engine) Reselect
LTS collects CCE logs (standard output, container file, and node file). Learn more

Collect: Fixed log stream | Custom log stream

These log types will be automatically collected to the corresponding log streams: (Original Name)
- Standard output or error: stdout-{ClusterID}
- Node file: hostfile-{ClusterID}
- Kubernetes event: event-{ClusterID}
- Container file: containerfile-{ClusterID}

Fixed log stream:
Pros:
Logs can be viewed by namespace, workload, or container name.
Cons:
Since differently structured logs are collected to the same stream, log structuring and SQL visual analysis are unavailable.
Since each stream has a limited write rate of 100 MB/s, there may be performance bottlenecks in heavy traffic.

CCE Cluster: lts-test
Cluster/ID: 8b4ec73a[redacted]0255ac100078

Log Group: k8s-log-[redacted]100078

Step 5 Check dependencies.

The system automatically checks whether the following items meet the requirements:

1. ICAgent has been installed (version 5.12.130 or later).
2. There is a host group with the same name and custom identifier **k8s-log-***ClusterID*.
3. There is a log group named **k8s-log-***ClusterID*.
4. There is a recommended log stream. If **Fixed log stream** is selected, this item is checked.

You need to meet all the requirements before moving on. If not, click **Auto Correct**.

NOTE

- **Auto Correct**: Check the previous settings with one click.
- **Check Again**: Recheck dependencies.
- If **Custom log stream** is selected, the check item **There is a log group named k8s-log-*ClusterID*** is optional. Use the switch to enable or disable the check item.

Step 6 (Optional) Select host groups.

1. Select one or more host groups from which you want to collect logs. If there are no desired host groups, click **Create** above the host group list to create one. For details, see **Creating a Host Group (Custom Identifier)**.

   NOTE

   - The host group to which the cluster belongs is selected by default. You can also select host groups as required.
   - You can also deselect the host group. In this case, the collection configuration does not take effect. You are advised to select a host group during the first ingestion. You can skip this step and configure host groups after the ingestion configuration is complete. There are two options to do this:
     - Choose **Host Management** in the navigation pane, click **Host Groups**, and associate host groups with ingestion configurations.
     - Choose **Log Ingestion** in the navigation pane, click an ingestion configuration, and make the association on the details page.
2. Click **Next: Configurations**.

Step 7 Configure the collection.

Specify collection rules. For details, see **Configuring the Collection**.

Step 8 (Optional) Configure log structuring.

For details, see **Cloud Structuring Parsing**.

NOTE

If structuring has been configured for the selected log stream, exercise caution when deleting it.

Step 9 (Optional) Configure indexes.

For details, see **Index Settings**.

Step 10 Click **Submit**. The created ingestion configuration will be displayed.

- Click its name to view its details.
- Click **Edit** in the **Operation** column to modify the ingestion configuration.
- Click **Configure Tag** in the **Operation** column to add a tag.
- Click **Copy** in the **Operation** column to copy the ingestion configuration.
- Click **Delete** in the **Operation** column to delete the ingestion configuration.

----End

Configuring the Collection

When CCE is used to ingest logs, the configuration details are as follows:

1. **Basic Information**: Enter a name containing 1 to 64 characters. Only letters, digits, hyphens (-), underscores (_), and periods (.) are allowed. The name cannot start with a period or underscore, or end with a period.
2. **Data Source**: Select a data source type and configure it.
   - **Container standard output**: Collects stderr and stdout logs of a specified container in the cluster.

NOTE

- The standard output of the matched container is collected to the specified log stream. Standard output to AOM stops.
- The container standard output must be unique to a host.

– **Container file**: Collects file logs of a specified container in the cluster.

– **Node file**: Collects files of a specified node in the cluster.

NOTE

You cannot add the same host path to more than one log stream.

– **Kubernetes event**: Collects event logs in the Kubernetes cluster.

NOTE

Kubernetes events of a Kubernetes cluster can be ingested to only one log stream.

Table 5-1 Collection configuration parameters

Parameter	Description
Container standard output	Collects container standard output to AOM, and collects stderr and stdout logs of a specified container in the cluster. Collecting container standard output to AOM: ICAgent is installed on hosts in the cluster by default, and logs is collected to AOM. The function of collecting container standard output to AOM is enabled. Disable this function to collect stdout streams to LTS. Either **Container Standard Output (stdout)** or **Container Standard Error (stderr)** must be enabled.
Container file	● **Collection Paths**: Add one or more host paths. LTS collects logs from the specified paths. **NOTE** ● If a container mount path has been configured for the CCE cluster workload, the paths added for this field are invalid. The collection paths take effect only after the mount path is deleted. ● You cannot add the same host path to more than one log stream. ● **Set Collection Filters**: Blacklisted directories or files will not be collected. If you specify a directory, all files in the directory are filtered out.
Node file	● **Collection Paths**: Add one or more host paths. LTS collects logs from the specified paths. **NOTE** You cannot add the same host path to more than one log stream. ● **Set Collection Filters**: Blacklisted directories or files will not be collected. If you specify a directory, all files in the directory are filtered out.

Parameter	Description
Kubernetes event	You do not need to configure this parameter. Only ICAgent 5.12.130 or later is supported.

3. **Kubernetes Matching Rules**: Set these parameters only when the data source type is set to **Container standard output** or **Container file**.

NOTE

After entering a regular expression matching rule, click the button of verification to verify the regular expression.

Table 5-2 Kubernetes matching rules

Parameter	Description
Namespace Name Regular Expression	Specifies the container whose logs are to be collected based on the namespace name. Regular expression matching is supported. **NOTE** LTS will collect logs of the namespaces with names matching this expression. To collect logs of all namespaces, leave this field empty.
Pod Name Regular Expression	Specifies the container whose logs are to be collected based on the pod name. Regular expression matching is supported. **NOTE** LTS will collect logs of the pods with names matching this expression. To collect logs of all pods, leave this field empty.
Container Name Regular Expression	Specifies the container whose logs are to be collected based on the container name (the Kubernetes container name is defined in **spec.containers**). Regular expression matching is supported. **NOTE** LTS will collect logs of the containers with names matching this expression. To collect logs of all containers, leave this field empty.
Label Whitelist	Specifies the containers whose logs are to be collected. If you want to set a Kubernetes label whitelist, **Label Key** is mandatory and **Label Value** is optional. **NOTE** LTS will match all containers with a Kubernetes label containing a specified **Label Key** with an empty corresponding **Label Value**. If **Label Value** is not empty, only containers with a Kubernetes label containing a specified **Label Key** that is equal to its **Label Value** are matched with LTS. **Label Key** requires full matching while **Label Value** supports regular matching. The relationship between multiple whitelists is based on an OR operation, meaning that a Kubernetes label can be matched as long as it meets any of the whitelists.

Parameter	Description
Label Blacklist	Specifies the containers whose logs are not to be collected. If you want to set a Kubernetes label blacklist, **Label Key** is mandatory and **Label Value** is optional. **NOTE** LTS will exclude all containers with a Kubernetes label containing a specified **Label Key** with an empty corresponding **Label Value**. If **Label Value** is not empty, only containers with a Kubernetes label containing a specified **Label Key** that is equal to its **Label Value** will be excluded. **Label Key** requires full matching while **Label Value** supports regular matching. The relationship between multiple blacklists is based on an OR operation, meaning that a Kubernetes label can be excluded as long as it meets any of the blacklists.
Kubernetes Label	After the **Kubernetes Label** is set, LTS adds related fields to logs. **NOTE** LTS adds the specified fields to the log when each **Label Key** has a corresponding **Label Value**. For example, if you enter "app" as the key and "app_alias" as the value, when the container label contains "app=lts", "{app_alias: lts}" will be added to the log.
Container Label Whitelist	Specifies the containers whose logs are to be collected. If you want to set a container label whitelist, **Label Key** is mandatory and **Label Value** is optional. **NOTE** LTS will match all containers with a container label containing a specified **Label Key** with an empty corresponding **Label Value**. If **Label Value** is not empty, only containers with a container label containing a specified **Label Key** that is equal to its **Label Value** are matched with LTS. **Label Key** requires full matching while **Label Value** supports regular matching. The relationship between multiple whitelists is based on an OR operation, meaning that a container label can be matched as long as it meets any of the whitelists.
Container Label Blacklist	Specifies the containers whose logs are not to be collected. If you want to set a container label blacklist, **Label Key** is mandatory and **Label Value** is optional. **NOTE** LTS will exclude all containers with a container label containing a specified **Label Key** with an empty corresponding **Label Value**. If **Label Value** is not empty, only containers with a container label containing a specified **Label Key** that is equal to its **Label Value** will be excluded. **Label Key** requires full matching while **Label Value** supports regular matching. The relationship between multiple blacklists is based on an OR operation, meaning that a container label can be excluded as long as it meets any of the blacklists.

Parameter	Description
Container Label	After the **Container Label** is set, LTS adds related fields to logs. **NOTE** LTS adds the specified fields to the log when each **Label Key** has a corresponding **Label Value**. For example, if you enter "app" as the key and "app_alias" as the value, when the container label contains "app=lts", "{app_alias: lts}" will be added to the log.
Environment Variable Whitelist	Specifies the containers whose logs are to be collected. If you want to set an environment variable whitelist, **Label Key** is mandatory and **Label Value** is optional. **NOTE** LTS will match all containers with environment variables containing either an **Environment Variable Key** with an empty corresponding **Environment Variable Value**, or an **Environment Variable Key** with its corresponding **Environment Variable Value**. **Label Key** requires full matching while **Label Value** supports regular matching. The relationship between multiple whitelists is based on an OR operation, meaning that a container environment variable can be matched as long as it meets any of key-value pairs.
Environment Variable Blacklist	Specifies the containers whose logs are not to be collected. If you want to set an environment variable blacklist, **Label Key** is mandatory and **Label Value** is optional. **NOTE** LTS will exclude all containers with environment variables containing either an **Environment Variable Key** with an empty corresponding **Environment Variable Value**, or an **Environment Variable Key** with its corresponding **Environment Variable Value**. **Label Key** requires full matching while **Label Value** supports regular matching. The relationship between multiple blacklists is based on an OR operation, meaning that a container environment variable can be excluded as long as it meets any of key-value pairs.
Environment Variable Label	After the environment variable label is set, the log service adds related fields to the log. **NOTE** LTS adds the specified fields to the log when each **Environment Variable Key** has a corresponding **Environment Variable Value**. For example, if you enter "app" as the key and "app_alias" as the value, when the Kubernetes environment variable contains "app=lts", "{app_alias: lts}" will be added to the log.

4. Perform other configurations.

Table 5-3 Other configurations

Parameter	Description
Split Logs	LTS can split logs. If this option is enabled, a single-line log larger than 500 KB will be split into multiple lines for collection. For example, a line of 600 KB log will be split into two lines for collection, the first line 500 KB and the second line 100 KB. If this option is disabled, a log larger than 500 KB will be truncated.
Collect Binary Files	LTS can collect binary files. Run the **file -i** *File_name* command to view the file type. **charset=binary** indicates that a log file is a binary file. If this option is enabled, binary log files will be collected, but only UTF-8 strings are supported. Other strings will be garbled on the LTS console. If this option is disabled, binary log files will not be collected.

5. Configure the log format and log time.

Table 5-4 Log collection settings

Parameter	Description
Log Format	● **Single-line**: Each log line is displayed as a single log event. ● **Multi-line**: Multiple lines of exception log events can be displayed as a single log event. This is helpful when you check logs to locate problems.
Log Time	**System time**: log collection time by default. It is displayed at the beginning of each log event. **NOTE** ● Log collection time is the time when logs are collected and sent by ICAgent to LTS. ● Log printing time is the time when logs are printed. ICAgent collects and sends logs to LTS with an interval of 1 second. ● Restriction on log collection time: Logs are collected within 24 hours before and after the system time.

Parameter	Description

	Time wildcard: You can set a time wildcard so that ICAgent will look for the log printing time as the beginning of a log event.
	● If the time format in a log event is **2019-01-01 23:59:59.011**, the time wildcard should be set to **YYYY-MM-DD hh:mm:ss.SSS**.
	● If the time format in a log event is **19-1-1 23:59:59.011**, the time wildcard should be set to **YY-M-D hh:mm:ss.SSS**.
	NOTE
	If a log event does not contain year information, ICAgent regards it as printed in the current year.
	Example:
	`YY   - year (19)`
	`YYYY - year (2019)`
	`M    - month (1)`
	`MM   - month (01)`
	`D    - day (1)`
	`DD   - day (01)`
	`hh   - hours (23)`
	`mm   - minutes (59)`
	`ss   - seconds (59)`
	`SSS - millisecond (999)`
	`hpm     - hours (03PM)`
	`h:mmpm    - hours:minutes (03:04PM)`
	`h:mm:sspm  - hours:minutes:seconds (03:04:05PM)`
	`hh:mm:ss ZZZZ (16:05:06 +0100)`
	`hh:mm:ss ZZZ  (16:05:06 CET)`
	`hh:mm:ss ZZ   (16:05:06 +01:00)`

Log Segmentation	This parameter needs to be specified if the **Log Format** is set to **Multi-line**. **By generation time** indicates that a time wildcard is used to detect log boundaries, whereas **By regular expression** indicates that a regular expression is used.
Regular Expression	You can set a regular expression to look for a specific pattern to indicate the beginning of a log event. This parameter needs to be specified when you select **Multi-line** for **Log Format** and **By regular expression** for **Log Segmentation**.

NOTE

The time wildcard and regular expression will look for the specified pattern right from the beginning of each log line. If no match is found, the system time, which may be different from the time in the log event, is used. In general cases, you are advised to select **Single-line** for **Log Format** and **System time** for **Log Time**.

5.1.2 Ingesting ECS Text Logs to LTS

ICAgent collects logs from hosts based on your specified collection rules, and packages and sends the collected log data to LTS on a log stream basis. You can view logs on the LTS console in real time.

Prerequisites

ICAgent has been **installed** and **added** to the host group.

Procedure

Perform the following operations to configure ECS log ingestion:

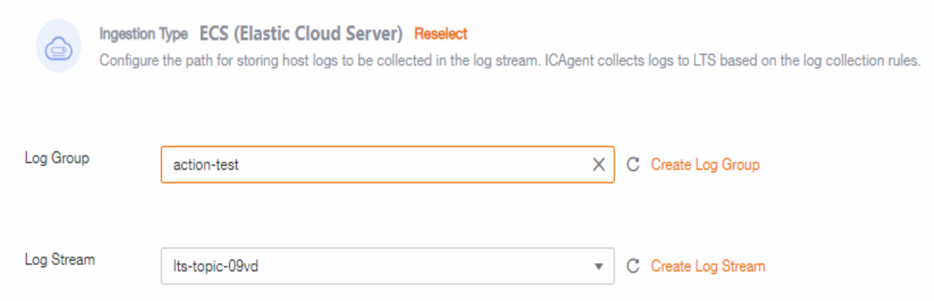
Step 1 Log in to the LTS console.

Step 2 In the navigation pane, choose **Log Ingestion**. Click **ECS (Elastic Cloud Server)**.

Step 3 Select a log group.

1. Select a log group from the **Log Group** drop-down list. If there are no desired log groups, click **Create Log Group** to create one.
2. Select a log stream from the **Log Stream** drop-down list. If there are no desired log streams, click **Create Log Stream** to create one.

Figure 5-3 Selecting a log stream



Ingestion Type ECS (Elastic Cloud Server) Reselect

Configure the path for storing host logs to be collected in the log stream. ICAgent collects logs to LTS based on the log collection rules.

Log Group: action-test

Log Stream: lts-topic-09vd

3. Click **Next: (Optional) Select Host Group**.

Step 4 Select a host group.

1. Select one or more host groups from which you want to collect logs. If there are no desired host groups, click **Create** above the host group list to create one. For details, see **Creating a Host Group (IP Address)**.

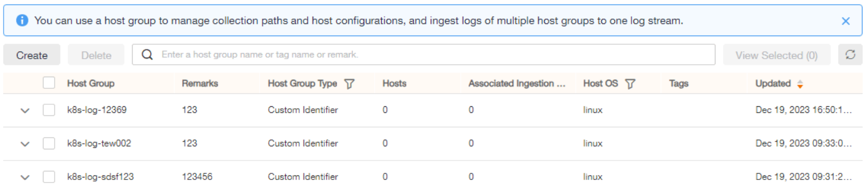
NOTE

You can also deselect the host group. In this case, the collection configuration does not take effect. You are advised to select a host group during the first ingestion. You can skip this step and configure host groups after the ingestion configuration is complete. There are two options to do this:

- Choose **Host Management** in the navigation pane, click **Host Groups**, and associate host groups with ingestion configurations.
- Choose **Log Ingestion** in the navigation pane, click an ingestion configuration, and make the association on the details page.

2. Click **Next: Configure Collection**.

Figure 5-4 Selecting a host group



You can use a host group to manage collection paths and host configurations, and ingest logs of multiple host groups to one log stream.

Host Group	Remarks	Host Group Type	Hosts	Associated Ingestion ...	Host OS	Tags	Updated
k8s-log-12369	123	Custom Identifier	0	0	linux		Dec 19, 2023 16:50:1...
k8s-log-tew002	123	Custom Identifier	0	0	linux		Dec 19, 2023 09:33:0...
k8s-log-sdsf123	123456	Custom Identifier	0	0	linux		Dec 19, 2023 09:31:2...

Step 5 Configure the collection.

Specify collection rules. For details, see **Configurations**.

Step 6 (Optional) Configure log structuring.

For details, see **Cloud Structuring Parsing**.

NOTE

If structuring has been configured for the selected log stream, exercise caution when deleting it.

Step 7 (Optional) Configure indexes.

For details, see **Index Settings**.

Step 8 Click **Submit**. The created ingestion configuration will be displayed.

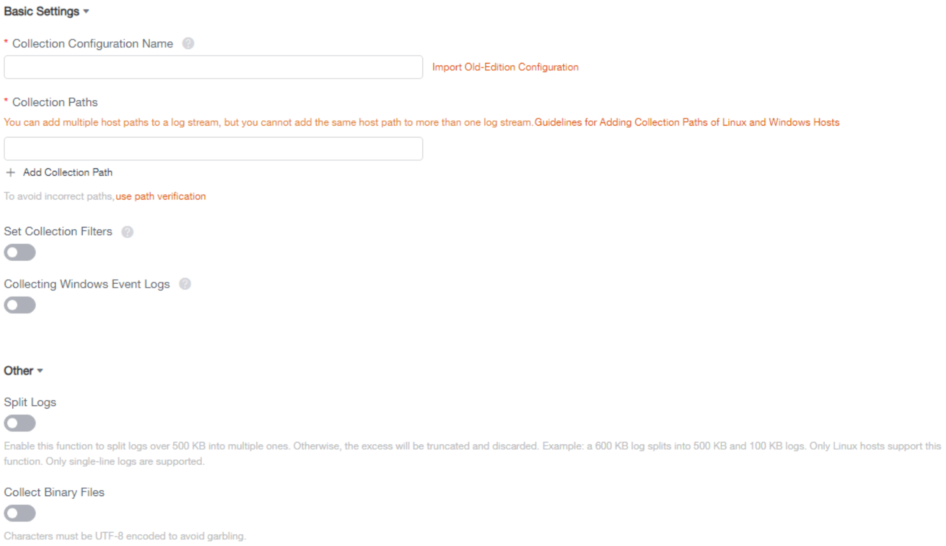
- Click its name to view its details.
- Click **Edit** in the **Operation** column to modify the ingestion configuration.
- Click **Configure Tag** in the **Operation** column to add a tag.
- Click **Copy** in the **Operation** column to copy the ingestion configuration.
- Click **Delete** in the **Operation** column to delete the ingestion configuration.

----End

Configurations

When you configure host log ingestion, the collection configuration details are as follows.

Figure 5-5 Configuring the collection



Basic Settings ▾

* Collection Configuration Name

Import Old-Edition Configuration

* Collection Paths

You can add multiple host paths to a log stream, but you cannot add the same host path to more than one log stream.Guidelines for Adding Collection Paths of Linux and Windows Hosts

+ Add Collection Path

To avoid incorrect paths,use path verification

Set Collection Filters

Collecting Windows Event Logs

Other ▾

Split Logs

Enable this function to split logs over 500 KB into multiple ones. Otherwise, the excess will be truncated and discarded. Example: a 600 KB log splits into 500 KB and 100 KB logs. Only Linux hosts support this function. Only single-line logs are supported.

Collect Binary Files

Characters must be UTF-8 encoded to avoid garbling.

1. **Collection Configuration Name**: Enter up to 64 characters. Only letters, digits, hyphens (-), underscores (_), and periods (.) are allowed. The name cannot start with a period or underscore, or end with a period.

NOTE

Import Old-Edition Configuration: Import the host ingestion configuration of the old version to the log ingestion of the new version.

- If LTS is newly installed and **Import Old-Edition Configuration** is not displayed, you can directly create a configuration without importing the old one.
- If LTS is upgraded, **Import Old-Edition Configuration** is displayed. If you need the host log path in the old configuration, import the old configuration or create one.

2. **Collection Paths**: Add one or more host paths. LTS collects logs from the specified paths.
   - Logs can be collected recursively. A double asterisk (**) can represent up to 5 directory levels in a path.

     For example, **/var/logs/**/a.log** matches the following logs:

     ```
     /var/logs/1/a.log
     /var/logs/1/2/a.log
     /var/logs/1/2/3/a.log
     /var/logs/1/2/3/4/a.log
     /var/logs/1/2/3/4/5/a.log
     ```

     NOTE

     - **/1/2/3/4/5/** indicates the 5 levels of directories under the **/var/logs** directory. All the **a.log** files found in all these levels of directories will be collected.
     - Only one double asterisk (**) can be contained in a collection path. For example, **/var/logs/**/a.log** is acceptable but **/opt/test/**/log/**** is not.
     - A collection path cannot begin with a double asterisk (**), such as **/**/test** to avoid collecting system files.
   - You can use an asterisk (*) as a wildcard for fuzzy match. The wildcard (*) can represent one or more characters of a directory or file name.

     NOTE

     If a log collection path is similar to **C:\windows\system32** but logs cannot be collected, enable the Web Application Firewall (WAF) and configure the path again.

     - Example 1: **/var/logs/*/a.log** will match all **a.log** files found in all directories under the **/var/logs/** directory:

       /var/logs/1/a.log

       /var/logs/2/a.log
     - Example 2: **/var/logs/service-*/a.log** will match files as follows:

       /var/logs/service-1/a.log

       /var/logs/service-2/a.log
     - Example 3: **/var/logs/service/a*.log** will match files as follows:

       /var/logs/service/a1.log

       /var/logs/service/a2.log
   - If the collection path is set to a directory (such as **/var/logs/**), only **.log**, **.trace**, and **.out** files in the directory are collected.

     If the collection path is set to a file name, the corresponding file is collected. Only text files can be collected. To query the file format, run **file -i** *File name*.

NOTE

- Ensure that sensitive information is not collected.
- It only collects logs of ECS (host) instances.
- A collection path can be configured only once. It means that a path of a host cannot be added for different log streams. Otherwise, log collection may be abnormal.
- If a collection path of a host has been configured in AOM, do not configure the path in LTS. If a path is configured in both AOM and LTS, only the path that is configured later takes effect.
- If log files were last modified more than 12 hours earlier than the time when the path is added, the files are not collected.

3. **Set Collection Filters**: Blacklisted directories or files will not be collected. If you specify a directory, all files in the directory are filtered out, but log files in the folders in the directory cannot be filtered out.

   Blacklist filters can be exact matches or wildcard pattern matches. For details, see **Collection Paths**.

   NOTE

   - If you blacklist a file or directory that has been set as a collection path in the previous step, the blacklist settings will be used and the file or files in the directory will be filtered out.
   - If a log has been added to the blacklist, it cannot be collected even if you create a log ingestion task. You can collect it again only after you delete the collection path from the blacklist.

4. **Collect Windows Event Logs**: To collect logs from Windows hosts, enable this option and set the following parameters.

Table 5-5 Parameters for collecting windows event logs

Parameter	Description
Log Type	Log types include **System**, **Application**, **Security**, and **Startup**.
First Collection Time Offset	Example: Set this parameter to **7** to collect logs generated within the 7 days before the collection start time. This offset takes effect only for the first collection to ensure that the logs are not repeatedly collected. Max: 7 days.
Event Level	You can filter and collect Windows events based on their severity (**information**, **warning**, **error**, **critical**, and **verbose**). This function is available only to Windows Vista or later.

5. Perform other configurations.

Table 5-6 Other configurations

Parameter	Description
Split Logs	LTS can split logs. If this option is enabled, a single-line log larger than 500 KB will be split into multiple lines for collection. For example, a line of 600 KB log will be split into two lines for collection, the first line 500 KB and the second line 100 KB. If this option is disabled, a log larger than 500 KB will be truncated.
Collect Binary Files	LTS can collect binary files. Run the **file -i** *File_name* command to view the file type. **charset=binary** indicates that a log file is a binary file. If this option is enabled, binary log files will be collected, but only UTF-8 strings are supported. Other strings will be garbled on the LTS console. If this option is disabled, binary log files will not be collected.

6. Configure the log format and log time.

Table 5-7 Log collection settings

Parameter	Description
Log Format	● **Single-line**: Each log line is displayed as a single log event. ● **Multi-line**: Multiple lines of exception log events can be displayed as a single log event. This is helpful when you check logs to locate problems.
Log Time	**System time**: log collection time by default. It is displayed at the beginning of each log event. **NOTE** ● Log collection time is the time when logs are collected and sent by ICAgent to LTS. ● Log printing time is the time when logs are printed. ICAgent collects and sends logs to LTS with an interval of 1 second. ● Restriction on log collection time: Logs are collected within 24 hours before and after the system time.

Parameter	Description

	Time wildcard: You can set a time wildcard so that ICAgent will look for the log printing time as the beginning of a log event.
	● If the time format in a log event is **2019-01-01 23:59:59.011**, the time wildcard should be set to **YYYY-MM-DD hh:mm:ss.SSS**.
	● If the time format in a log event is **19-1-1 23:59:59.011**, the time wildcard should be set to **YY-M-D hh:mm:ss.SSS**.
	NOTE
	If a log event does not contain year information, ICAgent regards it as printed in the current year.
	Example:
	`YY   - year (19)`
	`YYYY - year (2019)`
	`M    - month (1)`
	`MM   - month (01)`
	`D    - day (1)`
	`DD   - day (01)`
	`hh   - hours (23)`
	`mm   - minutes (59)`
	`ss   - seconds (59)`
	`SSS - millisecond (999)`
	`hpm     - hours (03PM)`
	`h:mmpm    - hours:minutes (03:04PM)`
	`h:mm:sspm  - hours:minutes:seconds (03:04:05PM)`
	`hh:mm:ss ZZZZ (16:05:06 +0100)`
	`hh:mm:ss ZZZ  (16:05:06 CET)`
	`hh:mm:ss ZZ   (16:05:06 +01:00)`

Log Segmentation	This parameter needs to be specified if the **Log Format** is set to **Multi-line**. **By generation time** indicates that a time wildcard is used to detect log boundaries, whereas **By regular expression** indicates that a regular expression is used.
Regular Expression	You can set a regular expression to look for a specific pattern to indicate the beginning of a log event. This parameter needs to be specified when you select **Multi-line** for **Log Format** and **By regular expression** for **Log Segmentation**.

NOTE

The time wildcard and regular expression will look for the specified pattern right from the beginning of each log line. If no match is found, the system time, which may be different from the time in the log event, is used. In general cases, you are advised to select **Single-line** for **Log Format** and **System time** for **Log Time**.

6 Host Management

6.1 Managing Host Groups

Host groups allow you to configure host log ingestion efficiently. You can sort multiple hosts to a host group and associate the host group with log ingestion configurations. The ingestion configurations will be applied to all the hosts in the host group, saving you the trouble of configuring the hosts individually.

- When there is a new host, simply add it to a host group and the host will automatically inherit the log ingestion configurations associated with the host group.
- You can also use host groups to modify the log collection paths for multiple hosts at one go.

Creating a Host Group (IP Address)

1. Log in to the LTS console, and choose **Host Management** in the navigation pane on the left. On the displayed page, click **Create Host Group** in the upper right corner.
2. In the displayed slide-out panel, enter a host group name, select **IP** for **Host Group Type**, and select a host OS (**Linux**).
3. In the host list, select one or more hosts to add to the group and click **OK**.
   - You can filter hosts by host name or host IP address. You can also click and enter multiple host IP addresses in the displayed search box to search for matches.
   - If your desired hosts are not in the list, click **Install ICAgent**. On the displayed page, install ICAgent on the hosts as prompted. For details, see **Installing ICAgent**.

Creating a Host Group (Custom Identifier)

1. On the **Host Management** page, click **Create Host Group** in the upper right corner.

2. In the displayed slide-out panel, enter a host group name, select **Custom Identifier** for **Host Group Type**, and select a host OS (**Linux**).

   NOTE

   You can click **Learn about the rules for filling in the collection path** to learn how to configure paths.

3. Click ⊕ Add to add a custom identifier.

   NOTE

   Up to 10 custom identifiers can be added.

4. Click **OK**.
5. Run the following commands to create the **custom_tag** file:
   a. Run the **cd /opt/cloud** command. In the **cloud** directory, run the **mkdir lts** command to create the **lts** directory.
   b. Run the **chmod 750 lts** command to modify the permission on the **lts** directory.
   c. Run the **touch custom_tag** command in the **lts** directory to create the **custom_tag** file.
   d. Run the **chmod 640 custom_tag;vi custom_tag** command to modify the **custom_tag** permission and open the file.
   e. Press **i** to enter the insert mode, enter a custom identifier, press **Esc**, enter **:wq!**, save the modification and exit.

   NOTE

   After 5, you can use either of the following methods to add hosts to a custom host group:

   Method 1 (recommended):

   Linux

   In the **custom_tag** file of the **/opt/cloud/lts** directory on the host, view the host identifier and add it to the custom host group identifiers to add the host to the host group. For example, in the **custom_tag** file of the **/opt/cloud/lts** directory on the host, the identifier of the host is **test1**, and the custom identifier of the host group is **test1**. That is, the host is added to the host group.

   Method 2:

   Linux

   - To add a host to a host group, add the custom host group identifier to the **custom_tag** file in the **/opt/cloud/lts** directory on the host. For example, if the custom identifier of the host group is **test**, enter **test** in the **custom_tag** file to add the host to the host group.
   - If multiple custom identifiers are added, enter any custom identifier in the **custom_tag** file of the **/opt/cloud/lts** directory on the host to add the host to the host group.

Modifying a Host Group

You can change the name of a host group, add hosts to or remove hosts from a host group, or associate a host group with log ingestion configurations.

Table 6-1 Operations on host groups

Operation	Procedure
Changing a host group name	1. On the **Host Management** page, the **Host Groups** tab is displayed by default. 2. On the **Host Groups** tab page, click the modification button in the **Operation** column of the row containing the target host group. 3. On the displayed dialog box, modify the information such as the host group name and custom identifier. 4. Click **OK**.
Adding hosts to a host group	**Method 1:** 1. On the **Host Management** page, click the **Host Groups** tab, and click ⌄ in the row containing the target host group. 2. Click **Add Host**. 3. In the displayed slide-out panel, all hosts that are not in the host group and run the selected OS type are displayed. Select the hosts to be added to the host group. - You can filter hosts by host name or host IP address. You can also click Search by Host IP Address ⌄ and enter multiple host IP addresses in the displayed search box to search for matches. - If your desired hosts are not in the list, click **Install ICAgent**. On the displayed page, install ICAgent on the hosts as prompted. For details, see **Installing ICAgent**. 4. Click **OK**. **Method 2:** 1. On the **Host Management** page, click the **Hosts** tab. 2. In the host list, select the target hosts and click **Add to Host Group**. 3. In the displayed slide-out panel, select the target host group. 4. Click **OK**.
Removing a host from a host group	1. On the **Host Management** page, click the **Host Groups** tab, and click ⌄ in the row containing the target host group. 2. In the host list, click **Remove** in the **Operation** column of the row containing the host to be removed. 3. In the displayed dialog box, click **OK**. **NOTE** This operation is not supported for hosts in the custom identifier host group.

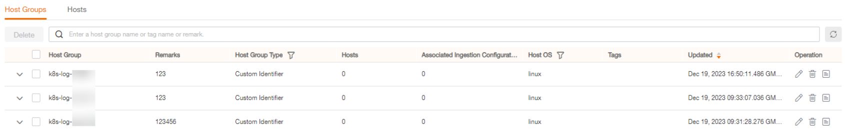
Operation	Procedure
Uninstalling ICAgent from a host	1. On the **Host Management** page, click the **Host Groups** tab, and click ⌄ in the row containing the target host group. 2. In the host list, click **Uninstall ICAgent** in the **Operation** column of the row containing the target host. 3. In the displayed dialog box, click **OK** to uninstall ICAgent from the host and remove the host from the host group. **NOTE** ● This operation is not supported for hosts in the custom identifier host group. ● If the host has also been added to other host groups, it will be removed from those groups as well.
Removing hosts from a host group	1. On the **Host Management** page, click the **Host Groups** tab, and click ⌄ in the row containing the target host group. 2. In the host list, select the target hosts and click the **Remove** button above the list. 3. Click **OK**.
Associating a host group with an ingestion configuration	1. On the **Host Management** page, click the **Host Groups** tab, and click ⌄ in the row containing the target host group. 2. Click the **Associated Ingestion Configuration** tab. 3. Click **Associate**. 4. In the displayed slide-out panel, select the target ingestion configuration. 5. Click **OK**. The associated ingestion configuration is displayed in the list.
Disassociating a host group from an ingestion configuration	1. On the **Associated Ingestion Configuration** tab, click **Disassociate** in the **Operation** column of the row containing the target ingestion configuration. 2. Click **OK**.
Disassociating a host group from multiple ingestion configurations	1. On the **Associated Ingestion Configuration** tab, select the target ingestion configurations and click the **Disassociate** button above the list. 2. Click **OK**.
Copying a host group ID	Hover your cursor over a host group name to copy the host group ID.

Deleting Host Groups

Deleting a single host group

1. On the **Host Management** page, the **Host Groups** tab is displayed by default.
2. On the **Host Groups** tab, click the deletion icon in the **Operation** column of the row containing the target host group.

Figure 6-1 Deleting a host group



	Host Group	Remarks	Host Group Type	Hosts	Associated Ingestion Configurat...	Host OS	Tags	Updated	Operation
□	k8s-log-[redacted]	123	Custom Identifier	0	0	linux		Dec 19, 2023 16:50:11.486 GM...	
□	k8s-log-[redacted]	123	Custom Identifier	0	0	linux		Dec 19, 2023 09:33:07.036 GM...	
□	k8s-log-[redacted]	123456	Custom Identifier	0	0	linux		Dec 19, 2023 09:31:28.276 GM...	

3. In the displayed dialog box, click **OK**.

Deleting host groups in batches

1. On the **Host Groups** tab, select multiple host groups to be deleted and click **Delete** above the list.
2. In the displayed dialog box, click **OK**.

6.2 Managing Hosts

6.2.1 Installing ICAgent

ICAgent is a log collection tool for LTS. To use LTS to collect logs from a host, you need to install ICAgent on the host. This section describes how to install ICAgent on a host.

Prerequisites

Ensure that the time and time zone of your local browser are consistent with those of the host to install ICAgent. If they are inconsistent, errors may occur during log reporting.

Installation Methods

There are two methods to install ICAgent.

Table 6-2 Installation methods

Method	Scenario
Initial installation	You can use this method to install ICAgent on a host that has no ICAgent installed.
Inherited installation (supported only for Linux hosts)	When ICAgent has already been installed on one host but needs to be installed on multiple hosts, you can use this method.

Initial Installation (Linux)

Step 1 Log in to the LTS console and choose **Host Management** in the navigation pane on the left.

Step 2 Click **Install ICAgent** in the upper right corner.

Step 3 Set **OS** to **Linux**.

Step 4 Select an installation mode:

- Obtain the AK/SK pair. For details, see **How Do I Obtain an AK/SK Pair?**

  Obtain and use the AK/SK pair of a public account.

  NOTICE

  Ensure that the public account and AK/SK pair will not be deleted or disabled. If the AK/SK pair is deleted, ICAgent cannot report data to LTS.

Step 5 Click **Copy Command** to copy the ICAgent installation command.

Step 6 Log in as user **root** to the host which is deployed in the region same as that you are logged in to (for example, by using a remote login tool such as PuTTY) and run the copied command. If you have chosen **Obtain AK/SK** as the installation mode, enter the AK/SK pair as prompted.

NOTE

- When the message **ICAgent install success** is displayed, ICAgent has been installed in the **/opt/oss/servicemgr/** directory of the host. You can then view the ICAgent status by choosing **Host Management** in the navigation pane of the LTS console and then clicking **Hosts**.
- If the installation fails, uninstall ICAgent and reinstall it. If the reinstallation fails, contact technical support.

----End

Inherited Installation (Linux)

Let's assume that you need to install ICAgent on multiple hosts, and one of the hosts already has ICAgent installed. The ICAgent installation package, **ICProbeAgent.tar.gz**, is in the **/opt/ICAgent/** directory. You can follow the directions below to install ICAgent on other hosts one by one.

1. Run the following command on the host where ICAgent has been installed, where *x.x.x.x* is the IP address of the host you want to install ICAgent on.

   bash /opt/oss/servicemgr/ICAgent/bin/remoteInstall/remote_install.sh -ip *x.x.x.x*

2. Enter the password for user **root** of the host when prompted.

NOTE

- If the Expect tool is installed on the host that has ICAgent installed, the ICAgent installation should be able to complete without prompting you for a password. Otherwise, enter the password as prompted.
- Ensure that user **root** can run SSH or SCP commands on the host where ICAgent has been installed to remotely communicate with the remote host to install ICAgent.
- When the message **ICAgent install success** is displayed, ICAgent has been installed in the **/opt/oss/servicemgr/** directory of the host. You can then view the ICAgent status by choosing **Host Management** in the navigation pane of the LTS console and then clicking **Hosts**.
- If the installation fails, uninstall ICAgent and reinstall it. If the reinstallation fails, contact technical support.

Batch Inherited Installation (Linux)

Let's assume that you need to install ICAgent on multiple hosts, and one of the hosts already has ICAgent installed. The ICAgent installation package, **ICProbeAgent.tar.gz**, is in the **/opt/ICAgent/** directory. You can follow the directions below to install ICAgent on other hosts in batches.

NOTICE

- The hosts must all belong to the same Virtual Private Cloud (VPC) and be on the same subnet.
- **Python 3.*** is required for batch installation. If you are prompted that Python cannot be found during ICAgent installation, install Python of a proper version and try again.

Prerequisites

The IP addresses and passwords of all hosts to install ICAgent have been collected, sorted in the **iplist.cfg** file, and uploaded to the **/opt/ICAgent/** directory on the host that has ICAgent installed. Each IP address and password in the **iplist.cfg** file must be separated by a space, as shown in the following example:

192.168.0.109 *Password* (Replace the IP address and password with the actual ones)

192.168.0.39 *Password* (Replace the IP address and password with the actual ones)

NOTE

- The **iplist.cfg** file contains sensitive information. You are advised to clear it after using it.
- If all hosts share a password, list only IP addresses in the **iplist.cfg** file and enter the password manually during execution. If one of the hosts uses a different password, type the password behind its IP address.

Procedure

1. Run the following command on the host that has ICAgent installed:

bash /opt/oss/servicemgr/ICAgent/bin/remoteInstall/remote_install.sh -batchModeConfig /opt/ICAgent/iplist.cfg

Enter the default password for user **root** of the hosts to install ICAgent. If the passwords of all hosts have been configured in the **iplist.cfg** file, press **Enter** to skip this step.

```
batch install begin
Please input default passwd:
send cmd to 192.168.0.109
send cmd to 192.168.0.39
2 tasks running, please wait...
2 tasks running, please wait...
2 tasks running, please wait...
End of install agent: 192.168.0.39
End of install agent: 192.168.0.109
All hosts install icagent finish.
```

If the message **All hosts install icagent finish.** is displayed, ICAgent has been installed on all the hosts listed in the configuration file.

2. You can then view the **ICAgent status** by choosing **Host Management** in the navigation pane of the LTS console and then clicking **Hosts**.

6.2.2 Upgrading ICAgent

To deliver a better collection experience, LTS regularly upgrades ICAgent. When LTS prompts you that a new ICAgent version is available, you can follow the directions here to obtain the latest version.

NOTE

Linux hosts support ICAgent upgrade on the **Host Management** page of the LTS console.

Procedure

1. Log in to the LTS console and choose **Host Management** in the navigation pane on the left.
2. On the **Host Management** page, click the **Hosts** tab.
3. Select **Intra-Region Hosts**, select one or more check boxes of hosts where ICAgent is to be upgraded, and click **Upgrade ICAgent**.

   Select **CCE Cluster**. In the drop-down list on the right, select the cluster whose ICAgent is to be upgraded, and click **Upgrade ICAgent**.

NOTE

- You need to create a CCE cluster before you can collect container standards and send them to AOM.
- To disable the function of exporting container standards to AOM, you need to have ICAgent 5.12.133 or later.
- If you create a CCE cluster for the first time, ICAgents will be installed on hosts in the cluster by default, and logs will be reported to AOM. **Output to AOM** is enabled by default. To report logs to LTS, disable **Output to AOM** before upgrading ICAgents. You are advised to choose **Log Ingestion** > **Cloud Service** > **Cloud Container Engine (CCE)** to collect container data and output it to LTS instead of AOM.
- CCE cluster ID (ClusterID): Each cluster has a fixed ID.
- When ICAgent is upgraded, LTS creates log groups and host groups for your CCE cluster. The name of the log group and host group is **k8s-log-***{ClusterID}*. You can create an ingestion configuration (**Cloud Services** > **Cloud Container Engine (CCE)**) to add logs of the current CCE cluster to the log group.
- If the ICAgent is not installed on hosts in a cluster or the ICAgent version is too early, click **Upgrade ICAgent** to install the ICAgent on all hosts in the cluster.

4. In the displayed dialog box, click **OK**.

   The upgrade begins. This process takes about a minute. When the ICAgent status changes from **Upgrading** to **Running**, the ICAgent upgrade has completed.

   NOTE

   If the ICAgent is abnormal after the upgrade or if the upgrade fails, log in to the host and run the installation command. ICAgent can be re-installed on top of itself.

6.2.3 Uninstalling ICAgent

If ICAgent is uninstalled from a host, log collection will be affected. Exercise caution when performing this operation.

NOTE

Uninstalling ICAgent does not delete the installation files. You need to delete them manually if necessary.

There are a number of ways to uninstall ICAgent:

- **Uninstalling ICAgent on the Console**: This can be used to uninstall ICAgent that has been successfully installed.
- **Uninstalling ICAgent on a Host**: This can be used to remove ICAgent that fails to be installed for reinstallation.
- **Remotely Uninstalling ICAgent**: This can be used to remotely uninstall ICAgent that has been successfully installed.
- **Batch Uninstalling ICAgent**: This can be used to uninstall ICAgent that has been successfully installed from a batch of hosts.

Uninstalling ICAgent on the Console

1. Log in to the LTS console and choose **Host Management** in the navigation pane on the left.

2. Click the **Hosts** tab.
3. Select one or more hosts where ICAgent is to be uninstalled and click **Uninstall ICAgent**.
4. In the displayed dialog box, click **OK**.

   The uninstallation begins. This process takes about a minute.

   Once uninstalled, the host will be removed from the host list.

   NOTE

   To reinstall ICAgent, wait for 5 minutes after the uninstallation completes, or the reinstalled ICAgent may be unintentionally uninstalled again.

Uninstalling ICAgent on a Host

1. Log in to a host where ICAgent is to be uninstalled as user **root**.
2. Run the following command:

   bash /opt/oss/servicemgr/ICAgent/bin/manual/uninstall.sh;

   If the message **ICAgent uninstall success** is displayed, the uninstallation has completed.

Remotely Uninstalling ICAgent

You can uninstall ICAgent on one host remotely from another host.

1. Run the following command on the host where ICAgent has been installed, *x.x.x.x* is the IP address of the host you want to uninstall ICAgent from.

   bash /opt/oss/servicemgr/ICAgent/bin/remoteUninstall/remote_uninstall.sh -ip *x.x.x.x*
2. Enter the password for user **root** of the host when prompted.

   NOTE

   - If the Expect tool is installed on the host that has ICAgent installed, the ICAgent uninstallation should be able to complete without prompting you for a password. Otherwise, enter the password as prompted.
   - Ensure that user **root** can run SSH or SCP commands on the host where ICAgent has been installed to communicate with the remote host to uninstall ICAgent.
   - If the message **ICAgent uninstall success** is displayed, the uninstallation has completed.

Batch Uninstalling ICAgent

If ICAgent has been installed on a host and the ICAgent installation package **ICProbeAgent.tar.gz** is in the **/opt/ICAgent/** directory of the host, you can use this method to uninstall ICAgent from multiple hosts at once.

NOTICE

The hosts must all belong to the same Virtual Private Cloud (VPC) and be on the same subnet.

Prerequisites

The IP addresses and passwords of all hosts to uninstall ICAgent have been collected, sorted in the **iplist.cfg** file, and uploaded to the **/opt/ICAgent/** directory on the host that has ICAgent installed. Each IP address and password in the **iplist.cfg** file must be separated by a space, as shown in the following example:

192.168.0.109 *Password* (Replace the IP address and password with the actual ones)

192.168.0.39 *Password* (Replace the IP address and password with the actual ones)

NOTE

- Because the **iplist.cfg** file contains sensitive information, you are advised to clear it after using it.
- If all hosts share a password, list only IP addresses in the **iplist.cfg** file and enter the password during execution. If one of the hosts uses a different password, type the password behind its IP address.

Procedure

1. Run the following command on the host that has ICAgent installed:

   bash /opt/oss/servicemgr/ICAgent/bin/remoteUninstall/remote_uninstall.sh -batchModeConfig /opt/ICAgent/iplist.cfg

   Enter the default password for user **root** of the hosts to uninstall ICAgent. If the passwords of all hosts have been configured in the **iplist.cfg** file, press **Enter** to skip this step.

   ```
   batch uninstall begin
   Please input default passwd:
   send cmd to 192.168.0.109
   send cmd to 192.168.0.39
   2 tasks running, please wait...
   End of uninstall agent: 192.168.0.109
   End of uninstall agent: 192.168.0.39
   All hosts uninstall icagent finish.
   ```

   If the message **All hosts uninstall icagent finish.** is displayed, the batch uninstallation has completed.

2. Choose **Host Management** > **Hosts** on the LTS console to view the ICAgent status.

6.2.4 ICAgent Statuses

The following table lists the ICAgent statuses.

Table 6-3 ICAgent statuses

Status	Description
Running	ICAgent is running properly.
Uninstalled	ICAgent is not installed.
Installing	ICAgent is being installed. This process takes about one minute.
Installation failed	ICAgent installation failed.

Status	Description
Upgrading	ICAgent is being upgraded. This process takes about one minute.
Upgrade failed	ICAgent upgrade failed.
Offline	ICAgent is abnormal because the Access Key ID/Secret Access Key (AK/SK) pair is incorrect. Obtain the correct AK/SK pair and install ICAgent again.
Faulty	ICAgent is faulty. Contact technical support.
Uninstalling	ICAgent is being uninstalled. This process takes about one minute.
Authentication error	Authentication fails because parameters were incorrectly configured during ICAgent installation.

7 Log Search and Analysis

7.1 Log Search

Follow the directions below to search logs by keyword and time range:

1. On the LTS console, choose **Log Management** in the navigation pane on the left.
2. In the log group list, click ⌄ on the left of a log group name.
3. In the log stream list, click a log stream name.
4. Above the search box, select a time range.

   There are three types of time range: relative time from now, relative time from last, and specified time. Select a time range as required.

   NOTE

   - From now: queries log data generated in a time range that ends with the current time, such as the previous 1, 5, or 15 minutes. For example, if the current time is 19:20:31 and 1 hour is selected as the relative time from now, the charts on the dashboard display the log data that is generated from 18:20:31 to 19:20:31.
   - From last: queries log data generated in a time range that ends with the current time, such as the previous 1 or 15 minutes. For example, if the current time is 19:20:31 and 1 hour is selected as the relative time from last, the charts on the dashboard display the log data that is generated from 18:00:00 to 19:00:00.
   - **Specified**: queries log data that is generated in a specified time range.
5. On the log stream details page, you can search for logs using the following methods:
   a. In the search area, click the search box, enter a keyword or select a field or keyword from the drop-down list, and click **Search**.

      Logs that contain the keyword are displayed on the **Raw Logs** tab page.

      NOTE

      - The structuring fields are displayed in **key:value** format.

   b. On the **Raw Logs** page, click a field in blue in the log content. You can select **Copy**, **Add To Search**, and **Exclude from Search** from the displayed drop-down list.

c. Click a field for which quick analysis has been created to add it to the search box.

> **NOTE**
>
> If the field you click already exists in the search box, it will be replaced by this newly added one. If the field is added for the first time, fields in the search box are searched using the AND operator.

d. In the search area, press the up and down arrows on the keyboard to select a keyword or search syntax from the drop-down list, press **Tab** or **Enter** to select a keyword or syntax, and click **Search**.

6. Under the log content, click > in front of the time. Structured fields can be displayed in table or JSON format.
   - On the **Table** tab page, you can search for logs by adding a field to a query or excluding a field from a query, or through whether a field exists, whether a field does not exist, or whether a field is hidden. For details, see **Search Syntax**.
   - On the **JSON** tab page, you can view or copy a log.
7. Set the layout.

a. Select **All layouts** from the drop-down list. The layout setting page is displayed. The layout list contains the default layout, pure layout, and default layout of container logs. You can set whether to display fields on the layout.

Cloud: This mode is applicable to users who have the write permission. Layout information is stored on the cloud.

Local Cache: This mode is applicable to users who have only the read permission. Layout information is cached in the local browser.

b. Click ⊕ to add a custom layout and set the layout name and visibility of layout fields.

c. After the setting is complete, click **OK**. The new custom layout is displayed in the drop-down list.

Common Log Search Operations

Log search operations include sharing logs and refreshing logs.

Table 7-1 Common operations

Operation	Description
Interactive search	Click ▽ in front of the search box. In the displayed **Interactive Search** dialog box, select fields for index configuration, set the filtering mode, and add associations and groups. After the setting is complete, you can preview the search syntax.
Creating quick search criteria	Click 💾 to create a quick search.

Operation	Description
Sharing logs	Click ↗ to copy the link of the current log search page to share the logs that you have searched.
Refreshing logs	You can click ⟳ | ▾ to refresh logs in two modes: manual refresh and automatic refresh. ● Manual refresh: Select **Refresh Now** from the drop-down list. ● Automatic refresh: Select an interval from the drop-down list to automatically refresh logs. The interval can be 15 seconds, 30 seconds, 1 minute, or 5 minutes.
Copying logs	Click ⧉ to copy the log content.
Viewing context of a log	Click 🔍 to view the log context. **NOTE** You can select **Simple View** to view the log context.
Simplifying field details	Click ⋯ to view the simplified field details.
Unfold/Fold	Click ↩ to display all the log content. Click ☰ to fold the log content. **NOTE** **Unfold** is enabled by default.
Downloading logs	Click ⤓ . On the displayed **Download Logs** page, click **Direct Download**. **Direct Download**: Download log files to the local PC. Up to 5,000 logs can be downloaded at a time. Select **.csv** or **.txt** from the drop-down list and click **Download** to export logs to the local PC. **NOTE** ● If you select **Export .csv**, logs are exported as a table. ● If you select **Export .txt**, logs are exported as a **.txt** file.
Hiding/Expanding all	Click ☰ to set the number of lines displayed in the log content. Click ☰ | ▾ to hide the log content. **NOTE** By default, logs are not collapsed, and two lines of logs are shown after collapsing. You can display up to six lines.

Operation	Description
JSON	Move the cursor over ⚙, click **JSON**, and set JSON formatting. **NOTE** Formatting is enabled by default. The default number of expanded levels is 2. ● Formatting enabled: Set the default number of expanded levels. Maximum value: **10**. ● Formatting disabled: JSON logs will not be formatted for display.
Collapse configuration	Move the cursor over ⚙, click **Log Collapse**, and set the maximum characters to display in a log. If the number of characters in a log exceeds the maximum, the extra characters will be hidden. Click **Expand** to view all. **NOTE** Logs are collapsed by default, with a default character limit of 400.
Log time display	Move the cursor over ⚙ and click **Log time display**. On the page that is displayed, set whether to display milliseconds and whether to display the time zone. **NOTE** By default, the function of displaying milliseconds is enabled.
Invisible fields (⊘)	This list displays the invisible fields configured in the layout settings. ● The ⊘ button is unavailable for log streams without layout settings configured. ● If the log content is **CONFIG_FILE** and layout settings are not configured, the default invisible fields include **appName**, **clusterId**, **clusterName**, **containerName**, **hostIPv6**, **NameSpace**, **podName**, and **serviceID**.

7.2 Built-in Reserved Fields

During log collection, LTS adds information such as the collection time, log type, and host IP address to logs in the form of Key-Value pairs. These fields are built-in reserved fields of LTS.

NOTE

- When using APIs to write log data or add ICAgent configurations, do not set field names to built-in reserved fields. Otherwise, problems such as duplicate field names and inaccurate query may occur.
- The name of a custom log field cannot contain double underscores (_). Otherwise, the index cannot be configured.

Log Example

The following is a CCE log. The value of the **content** field is the original log text, and other fields are common built-in reserved fields.

```
{
"hostName":"epstest-xx518",
"hostIP":"192.168.0.31",
"clusterId":"c7f3f4a5-xxxx-11ed-a4ec-0255ac100b07",
"pathFile":"stdout.log",
"content":"level=error ts=2023-04-19T09:21:21.333895559Z",
"podIp":"10.0.0.145",
"containerName":"config-reloader",
"clusterName":"epstest",
"nameSpace":"monitoring",
"hostIPv6":"",
"collectTime":"1681896081334",
"appName":"alertmanager-alertmanager",
"hostId":"318c02fe-xxxx-4c91-b5bb-6923513b6c34",
"lineNum":"1681896081333991900",
"podName":"alertmanager-alertmanager-54d7xxxx-wnfsh",
"__time__":"1681896081334",
"serviceID":"cf5b453xxxad61d4c483b50da3fad5ad",
"category":"LTS"
}
```

Built-in Reserved Field Description

Table 7-2 Built-in reserved field description

Field	Data Format	Index and Statistics Settings	Description
collectTime	Integer, Unix timestamp (ms)	Index setting: After this function is enabled, a field index is created for collectTime by default. The index data type is long. Enter collectTime: xxx during the query.	Indicates the time when logs are collected by ICAgent. In the example, "collectTime":"1681896081334" is 2023-04-19 17:21:21 when converted into standard time.

Field	Data Format	Index and Statistics Settings	Description
__time__	Integer, Unix timestamp (ms)	Index setting: After this function is enabled, a field index is created for time by default. The index data type is long. This field cannot be queried.	Log time refers to the time when a log is displayed on the console. In the example, "__time__":"1681896081334" is 2023-04-19 17:21:21 when converted into standard time. By default, the collection time is used as the log time. You can also customize the log time.
lineNum	Integer	Index setting: After this function is enabled, a field index is created for lineNum by default. The index data type is long.	Line number (offset), which is used to sort logs. Non-high-precision logs are generated based on the value of collectTime. The default value is collectTime * 1000000 + 1. For high-precision logs, the value is the nanosecond value reported by users. Such as "lineNum":"1681896081333991900" in the example.
category	String	Index setting: After this function is enabled, a field index is created for category by default. The index data type is string, and the delimiters are empty. Enter category: xxx during the query.	Log type, indicating the source of the log. For example, the field value of logs collected by ICAgent is LTS, and that of logs reported by a cloud service such as DCS is DCS.

Field	Data Format	Index and Statistics Settings	Description
clusterName	String	Index setting: After this function is enabled, a field index is created for clusterName by default. The index data type is string, and the delimiters are empty. Enter clusterName: xxx during the query.	Cluster name, used in the Kubernetes scenario. Such as "clusterName":"epstest" in the example.
clusterId	String	Index setting: After this function is enabled, a field index is created for clusterId by default. The index data type is string, and the delimiters are empty. Enter clusterId: xxx during the query.	Cluster ID, used in the Kubernetes scenario. Such as "clusterId":"c7f3f4a5-xxxx-11ed-a4ec-0255ac100b07" in the example.
nameSpace	String	Index setting: After this function is enabled, a field index is created for nameSpace by default. The index data type is string, and the delimiters are empty. Enter nameSpace: xxx during the query.	Namespace used in the Kubernetes scenario. Such as "nameSpace":"monitoring" in the example.
appName	String	Index setting: After this function is enabled, a field index is created for appName by default. The index data type is string, and the delimiters are empty. Enter appName: xxx during the query.	Component name, used as the name of the workload in the Kubernetes scenario. Such as "appName":"alertmanager-alertmanager" in the example.

Field	Data Format	Index and Statistics Settings	Description
serviceID	String	Index setting: After this function is enabled, a field index is created for serviceID by default. The index data type is string, and the delimiters are empty. Enter serviceID: xxx during the query.	Workload ID in the Kubernetes scenario. Such as "serviceID":"cf5b453xxxad61d4c483b50da3fad5ad" in the example.
podName	String	Index setting: After this function is enabled, a field index is created for podName by default. The index data type is string, and the delimiters are empty. Enter podName: xxx during the query.	Pod name in the Kubernetes scenario. Such as "podName":"alertmanager-alertmanager-0" in the example.
podIp	String	Index setting: After this function is enabled, a field index is created for podIp by default. The index data type is string, and the delimiters are empty. Enter podIp: xxx during the query.	Pod IP in the Kubernetes scenario. Such as "podIp":"10.0.0.145" in the example.
containerName	String	Index setting: After this function is enabled, a field index is created for containerName by default. The index data type is string, and the delimiters are empty. Enter containerName: xxx during the query.	Container name used in the Kubernetes scenario. Such as "containerName":"config-reloader" in the example.

Field	Data Format	Index and Statistics Settings	Description
hostName	String	Index setting: After this function is enabled, a field index is created for hostName by default. The index data type is string, and the delimiters are empty. Enter hostName: xxx during the query.	Indicates the host name where ICAgent resides. Such as "hostName":"epstest-xx518" in the example.
hostId	String	Index setting: After this function is enabled, a field index is created for hostId by default. The index data type is string, and the delimiters are empty. Enter hostId: xxx during the query.	Indicates the host ID where ICAgent resides. The ID is generated by ICAgent. Such as "hostId":"318c02fe-xxxx-4c91-b5bb-6923513b6c34" in the example.
hostIP	String	Index setting: After this function is enabled, a field index is created for hostIP by default. The index data type is string, and the delimiters are empty. Enter hostIP: xxx during the query.	Host IP address where the log collector resides (applicable to IPv4 scenario) Such as "hostIP":"192.168.0.31" in the example.
hostIPv6	String	Index setting: After this function is enabled, a field index is created for hostIPv6 by default. The index data type is string, and the delimiters are empty. Enter hostIPv6: xxx during the query.	Host IP address where the log collector resides (applicable to IPv6 scenario) Such as "hostIPv6":"" in the example.

Field	Data Format	Index and Statistics Settings	Description
pathFile	String	Index setting: After this function is enabled, a field index is created for pathFile by default. The index data type is string, and the delimiters are empty. Enter pathFile: xxx during the query.	File path is the path of the collected log file. Such as "pathFile":"stdout.log" in the example.
content	String	Index setting: After **Index Whole Text** is enabled, the delimiter defined by the full-text index is used to segment the value of the content field. The content field cannot be configured in the field index.	Original log content Such as "content":"level=error ts=2023-04-19T09:21:21.333895559Z" in the example.
__receive_time__	Integer, Unix timestamp (ms)	Index setting: After this function is enabled, a field index is created for **__receive_time__** by default. The index data type is long.	Time when a log is reported to the server, which is same as the time when the LTS collector receives the log.
__client_time__	Integer, Unix timestamp (ms)	Index setting: After this function is enabled, a field index is created for **__client_time__** by default. The index data type is long.	Time when the client reports a device log.

Field	Data Format	Index and Statistics Settings	Description
_content_parse_fail_	String	Index setting: After this function is enabled, a field index is created for **_content_parse_fail_** by default. The index data type is string, and the default delimiter is used. Enter **_content_parse_fail_ : xxx** during the query.	Content of the log that fails to be parsed.
__save_time__	Integer, Unix timestamp (ms)	The **__save_time__** field cannot be configured in the field index.	Time field of the log stream engine. Log data in the period specified by this field is obtained.
__time	Integer, Unix timestamp (ms)	The **__time** field cannot be configured in the field index.	N/A
logContent	String	The **logContent** field cannot be configured in the field index.	N/A
logContentSize	Integer	The **logContentSize** field cannot be configured in the field index.	N/A
logIndexSize	Integer	The **logIndexSize** field cannot be configured in the field index.	N/A
groupName	String	The **groupName** field cannot be configured in the field index.	N/A
logStream	String	The **logStream** field cannot be configured in the field index.	N/A

7.3 Index Settings

An index is a storage structure used to query and analyze logs. Different index settings will generate different query and analysis results. Configure the index settings as required.

Log Example

The following is a typical log. The value of the **content** field is the original log text. Use commas (,) to parse the original log into three fields: **level**, **status**, and **message**.

In the example log, **hostName**, **hostIP**, and **pathFile** are common system reserved fields. For details about the system fields, see **Built-in Reserved Fields**.

```
{
"hostName":"epstest-xx518",
"hostIP":"192.168.0.31",
"pathFile":"stdout.log",
"content":"error,400,I Know XX",
"level":"error",
"status":400,
"message":"I Know XX"
}
```

Index Types

The following table lists the index types supported by LTS.

Table 7-3 Index types

Index Type	Description
Index Whole Text	LTS splits all field values of an entire log into multiple words when this function is enabled. **NOTE** • The custom label field uploaded by the user is not included in the full-text index. If you want to search for the custom label field, add the corresponding index field. • Reserved fields are not included in full-text indexes. You need to use the Key:Value index to search for fields. For details, see **Built-in Reserved Fields**.

Index Type	Description
Index Fields	Query logs by specified field names and values (Key:Value). **NOTE** - LTS enables index fields for certain system reserved fields by default. For details, see **Built-in Reserved Fields**. - If an index field is configured for a field, the delimiter of the field value is subject to the index field configuration. - The quick analysis column in structuring settings has been removed. To use this function, configure index fields and enable quick analysis for the required fields. Here are two examples: - In the log example, the level and status index fields are configured. The level field is of the **string** type, the field value is error, and a delimiter is configured. The status field is of the **long** type, and no delimiter needs to be configured. You can use level:error to search for all logs whose level value is error. - In the log example, LTS creates indexes for built-in reserved fields such as hostName, hostIP, and pathFile by default.

Precautions

- Either whole text indexing or index fields must be configured.
- Index settings (such as adding, editing, and deleting fields and modifying items) take effect only for new log data but not for historical log data. Currently, indexes cannot be recreated for historical logs.
- After the index function is disabled, the storage space of historical indexes is automatically cleared after the data storage period of the current log stream expires.
- LTS enables index fields for certain system reserved fields by default. For details, see **Built-in Reserved Fields**.
- Different index settings will generate different query and analysis results. Configure the index settings as required. Full-text indexes and index fields do not affect each other.
- After the index configuration is modified, the modification takes effect only for newly written log data.

Configuring Whole Text Indexing

Step 1 Log in to the LTS console and choose **Log Management**.

Step 2 In the log group list, click ⌄ on the left of a log group, and click a log stream to go to the details page.

Step 3 Click ⚙ in the upper right corner to go to the **Index Settings** page.

Step 4 **Index Whole Text** is enabled by default.

NOTE

- For automatic configuration, the intersection of the raw logs and built-in fields in the last 15 minutes is obtained by default. LTS automatically combines the intersection of the raw logs and built-in fields, current structured fields, and tag fields to form the table data below the field index.
- If no raw log is generated within 15 minutes, obtain the hostIP, hostName, pathFile, structured field, and tag field to form the table data below the field index.
- When **Log Structuring** is configured for ECS ingestion, the category, hostName, hostId, hostIP, hostIPv6 and pathFile fields are automatically added on the **Index Settings** page. A field will not be added if the same one already exists.
- When **Log Structuring** is configured for CCE ingestion, the category, clusterId, clusterName, nameSpace, podName, containerName, appName, hostName, hostId, hostIP, hostIPv6 and pathFile fields are automatically added to **Index Settings** page. A Field will not be added if the same one already exists.

Step 5 Set parameters as described in **Table 7-4**.

Table 7-4 Whole text indexing parameters

Parameter	Description
Index Whole Text	If **Index Whole Text** is enabled, a full-text index is created.
Case-Sensitive	Indicates whether letters are case-sensitive during query. • If this function is enabled, the query result is case-sensitive. For example, if the example log contains **Know**, you can query the log only with **Know**. • If this function is disabled, the query result is case-insensitive. For example, if the example log contains **Know**, you can also query the log with **KNOW** or **know**.

Parameter	Description
Include Chinese	Indicates whether to distinguish between Chinese and English during query. ● After the function is enabled, if the log contains Chinese characters, the Chinese content is split based on unigram segmentation and the English content is split based on delimiters. **NOTE** – Unigram segmentation is to split a Chinese string into Chinese characters. – The advantage of unigram segmentation is efficient word segmentation of massive logs, and other Chinese segmentation methods have great impact on the write speed. ● After this function is disabled, all content is split based on delimiters. For example, assume that the log content is: **error,400,I Know TodayIsMonday**. ● After this function is disabled, the English content is split based on delimiters. The log is split into **error**, **400**, **I**, **Know**, and **TodayIsMonday**. You can search for the log by **error** or **TodayIsMonday**. ● After this function is enabled, the background analyzer of LTS splits the log into **error**, **400**, **I**, **Know**, **Today**, **Is**, and **Monday**. You can search for the log by **error** or **Today**.
Delimiters	Splits the log content into multiple words based on the specified delimiter. Default delimiters include ,'";=()[]{}@&<>/:\n\t\r and spaces. If the default settings cannot meet your requirements, you can customize delimiters. All ASCII codes can be defined as delimiters. If the delimiter is set to null, the field value is regarded as a whole. You can search for the corresponding log only through the complete character string or fuzzy search. For example, assume that the log content is: **error,400,I Know TodayIsMonday**. ● If no delimiter is set, the entire log is regarded as a string **error,400,I Know TodayIsMonday**. You can search for the log only by the complete string **error,400,I Know TodayIsMonday** or by fuzzy search **error,400,I K***. ● If the delimiter is set to a comma (,), the raw log is split into: **error**, **400**, and **I Know TodayIsMonday**. You can find the log by fuzzy search or exact words, for example, **error**, **400**, **Kn***, and **TodayIs***. ● If the delimiter is set to a comma (,) and space, the raw log is split into: **error**, **400**, **I**, **Know**, **TodayIsMonday**. You can find the log by fuzzy search or exact words, for example, **Know**, and **TodayIs***.

Parameter	Description
ASCII Delimiters	Click **Add ASCII Delimiter** and enter the ASCII value by referring to **ASCII Table**.

Step 6 Click **OK**.

----End

Configuring Index Fields

When creating a field index, you can add a maximum of 500 fields. A maximum of 100 subfields can be added for JSON fields.

NOTE

Custom and special delimiters of field indexes are available only to whitelisted users. To use them, .

Step 1 Click **Add Field** under **Index Fields** and set field information by referring to **Table 7-5**.

Step 2 Alternatively, select fields and click **Batch configuration**. On the displayed page, configure parameters.

Step 3 Configure the index field by referring to **Table 7-5**.

NOTE

- The preceding indexing parameters take effect only for the current field.
- Index fields that do not exist in log content are invalid.

Table 7-5 Index field parameters

Parameter	Description
Field Name	Log field name, including **level** in the example log. The field name can contain only letters, digits, and underscores (_), and must start with a letter or underscore (_). The field name cannot contain double underscores (__). **NOTE** ● Double underscores (__) are used in built-in reserved fields that are not displayed to users in LTS. Double underscores (__) cannot be used in custom log field names. Otherwise, field index names cannot be configured. ● LTS enables index fields for certain system reserved fields by default. For details, see **Built-in Reserved Fields**.
Type	● Data type of the log field value. The options are **string**, **long**, and **float**. ● Fields of long and float types do not support **Case-Sensitivity**, **Include Chinese** and **Delimiters**.

Parameter	Description
Case-Sensitive	Indicates whether letters are case-sensitive during query. ● If this function is enabled, the query result is case-sensitive. For example, if the **message** field in the example log contains **Know**, you can query the log only with **message:Know**. ● If this function is disabled, the query result is case-insensitive. For example, if the **message** field in the example log contains **Know**, you can also query the log with **message:KNOW** or **message:know**.
Common Delimiters	Splits the log content into multiple words based on the specified delimiter. Default delimiters include ,'";=()[]{}@&<>/:\n\t\r and spaces. If the default settings cannot meet your requirements, you can customize delimiters. All ASCII codes can be defined as delimiters. If the delimiter is set to null, the field value is regarded as a whole. You can search for the corresponding log only through the complete character string or fuzzy search. For example, the content of the **message** field in the example log is **I Know TodayIsMonday**. ● If no delimiter is set, the entire log is regarded as a string **I Know TodayIsMonday**. You can search for the log only by the complete string **message:I Know TodayIsMonday** or by fuzzy search **message:I Know TodayIs***. ● If the delimiter is set to a space, the raw log is split into: **I**, **Know**, and **TodayIsMonday**. You can find the log by fuzzy search or exact words, for example, **message:Know**, or **message: TodayIsMonday**.
ASCII Delimiters	Click **Add ASCII Delimiter** and enter the ASCII value by referring to **ASCII Table**.

Parameter	Description
Include Chinese	Indicates whether to distinguish between Chinese and English during query. ● After the function is enabled, if the log contains Chinese characters, the Chinese content is split based on unigram segmentation and the English content is split based on delimiters. **NOTE** – Unigram segmentation is to split a Chinese string into Chinese characters. – The advantage of unigram segmentation is efficient word segmentation of massive logs, and other Chinese segmentation methods have great impact on the write speed. ● After this function is disabled, all content is split based on delimiters. For example, the content of the **message** field in the example log is **I Know TodayIsMonday**. ● After this function is disabled, the English content is split based on delimiters. The log is split into **I**, **Know**, and **TodayIsMonday**. You can search for the log by **message:Know** or **message:TodayIsMonday**. ● After this function is enabled, the background analyzer of LTS splits the log into **I**, **Know**, **Today**, **Is**, and **Monday**. You can search for the log by **message:Know** or **message:Today**.
Quick Analysis	By default, this option is enabled, indicating that this field will be sampled and collected. For details, see **Quick Analysis**. **NOTE** ● The principle of quick analysis is to collect statistics on 100,000 logs that match the search criteria, not all logs. ● The maximum length of a field for quick analysis is 2000 bytes. ● The quick analysis field area displays the first 100 records.
Operation	Click 🗑 to delete the target field.

Step 4 Click **OK**.

----End

Auto Index Field Configuration

When creating an index field, you can click **Auto Config**. The log service automatically adds some index fields. You can add or delete fields as required.

- The log service automatically generates an index field based on the first content in the preview data during collection.

- The log service selects several common built-in reserved fields (such as **hostIP**, **hostName**, and **pathFile**) and adds them to the index field.

ASCII Table

Table 7-6 ASCII table

ASCII Value	Character	ASCII Value	Character	ASCII Value	Character	ASCII Value	Character
0	NUL (Null)	32	Space	64	**@**	96	`
1	SOH (Start of heading)	33	**!**	65	**A**	97	**a**
2	STX (Start of text)	34	**"**	66	**B**	98	**b**
3	ETX (End of text)	35	**#**	67	**C**	99	**c**
4	EOT (End of transmission)	36	**$**	68	**D**	100	**d**
5	ENQ (Enquiry)	37	**%**	69	**E**	101	**e**
6	ACK (Acknowledge)	38	**&**	70	**F**	102	**f**
7	BEL (Bell)	39	**'**	71	**G**	103	**g**
8	BS (Backspace)	40	**(**	72	**H**	104	**h**
9	HT (Horizontal tab)	41	**)**	73	**I**	105	**i**
10	LF (Line feed)	42	*	74	**J**	106	**j**
11	VT (Vertical tab)	43	**+**	75	**K**	107	**k**
12	FF (Form feed)	44	**,**	76	**L**	108	**l**
13	CR (Carriage return)	45	**-**	77	**M**	109	**m**
14	SO (Shift out)	46	**.**	78	**N**	110	**n**
15	SI (Shift in)	47	**/**	79	**O**	111	**o**

ASCII Value	Character	ASCII Value	Character	ASCII Value	Character	ASCII Value	Character
16	DLE (Data link escape)	48	**0**	80	**P**	112	**p**
17	DC1 (Device control 1)	49	**1**	81	**Q**	113	**q**
18	DC2 (Device control 2)	50	**2**	82	**R**	114	**r**
19	DC3 (Device control 3)	51	**3**	83	**S**	115	**s**
20	DC4 (Device control 4)	52	**4**	84	**T**	116	**t**
21	NAK (Negative acknowledge)	53	**5**	85	**U**	117	**u**
22	SYN (Synchronous idle)	54	**6**	86	**V**	118	**v**
23	ETB (End of transmission block)	55	**7**	87	**W**	119	**w**
24	CAN (Cancel)	56	**8**	88	**X**	120	**x**
25	EM (End of medium)	57	**9**	89	**Y**	121	**y**
26	SUB (Substitute)	58	**:**	90	**Z**	122	**z**
27	ESC (Escape)	59	**;**	91	**[**	123	**{**
28	FS (File separator)	60	**<**	92	\	124	**|**
29	GS (Group separator)	61	**=**	93	**]**	125	**}**
30	RS (Record separator)	62	**>**	94	**^**	126	**~**
31	US (Unit separator)	63	**?**	95	_	127	DEL (Delete)

7.4 Cloud Structuring Parsing

7.4.1 Overview

Log data can be structured or unstructured. Structured data is quantitative data or can be defined by unified data models. It has a fixed length and format. Unstructured data has no pre-defined data models and cannot be fit into two-dimensional tables of databases.

During log structuring, logs with fixed or similar formats are extracted from a log stream based on your defined structuring method and irrelevant logs are filtered out.

Precautions

- You have created a log stream.
- Log structuring is recommended when most logs in a log stream share a similar pattern.
- After the structuring configuration is modified, the modification takes effect only for newly written log data.

Creating a Structuring Rule

Add structuring rules to a log stream and LTS will extract logs based on the rules.

To structure logs:

Step 1 Log in to the LTS console and choose **Log Management** in the navigation pane on the left.

Step 2 Select a log group and a log stream.

Step 3 On the log stream details page, click ⚙ in the upper right corner. On the page displayed, select **Cloud Structuring Parsing** to structure logs.

- **Regular Expressions**
- **JSON**
- **Delimiter**
- **Nginx**
- **Structuring Template**

You can then use SQL statements to query and analyze structured logs in the same way as you query and analyze data in two-dimensional database tables.

NOTE

- If a structured field exceeds 20 KB, only the first 20 KB is retained.
- The following system fields cannot be extracted during log structuring: **groupName**, **logStream**, **lineNum**, **content**, **logContent**, **logContentSize**, **collectTime**, **category**, **clusterId**, **clusterName**, **containerName**, **hostIP**, **hostId**, **hostName**, **nameSpace**, **pathFile**, and **podName**.

Step 4 Click **Save**.

----End

Modifying a Structuring Rule

To modify a structuring rule, perform the following steps:

Step 1 On the **Log Structuring** page, click ✎ to modify a structuring rule.

NOTE

- You can modify the structuring rules, including the structuring mode, log extraction field, and tag field.
- System templates cannot be modified.

Step 2 Click **Save**.

----End

Deleting a Structuring Rule

If a log structuring rule is no longer used, perform the following steps to delete it:

Step 1 On the **Log Structuring** page, click 🗑 to delete a structuring rule.

Step 2 In the displayed dialog box, click **OK**.

NOTE

Deleted structuring rules cannot be restored. Exercise caution when performing this operation.

----End

7.4.2 Structuring Modes

LTS provides five log structuring modes: regular expressions, JSON, delimiter, Nginx, and structuring template. You can make your choice flexibly.

Regular Expressions

If you choose regular expressions, fields are extracted based on your defined regular expressions.

Step 1 Select a typical log event as the sample.

- Click **Select from existing log events**, select a log event, and click **OK**. You can select different time ranges to filter logs.
- Click **Paste from Clipboard** to copy the cut log content to the sample log box.

NOTE

There are three types of time range: relative time from now, relative time from last, and specified time. Select a time range as required.

- From now: queries log data generated in a time range that ends with the current time, such as the previous 1, 5, or 15 minutes. For example, if the current time is 19:20:31 and 1 hour is selected as the relative time from now, the charts on the dashboard display the log data that is generated from 18:20:31 to 19:20:31.
- From last: queries log data generated in a time range that ends with the current time, such as the previous 1 or 15 minutes. For example, if the current time is 19:20:31 and 1 hour is selected as the relative time from last, the charts on the dashboard display the log data that is generated from 18:00:00 to 19:00:00.
- **Specified**: queries log data that is generated in a specified time range.

Step 2 Extract fields. Extracted fields are shown with their example values. You can extract fields in two ways:

- **Auto generate**: Select the log content you want to extract as a field in the sample log event. In the dialog box displayed, set the field name. The name must start with a letter and contain only letters and digits. Then click Add.
- **Manually enter**: Enter a regular expression in the text box and click **Extract Field**. A regular expression may contain multiple capturing groups, which group strings with parentheses. There are three types of capturing groups:
  - (*exp*): Capturing groups are numbered by counting their opening parentheses from left to right. The numbering starts with 1.
  - (?<*name*>*exp*): named capturing group. It captures text that matches *exp* into the group *name*. The group name must start with a letter and contain only letters and digits. A group is recalled by group name or number.
  - (?:*exp*): non-capturing group. It captures text that matches *exp*, but it is not named or numbered and cannot be recalled.

NOTE

- When you select **manually enter**, the regular expression can contain up to 5000 characters. You do not have to name capturing groups when writing the regular expression. When you click **Extract Field**, those unnamed groups will be named as **field1**, **field2**, **field3**, and so on.

Step 3 Click **Save**. The type of extracted fields cannot be changed after the structuring is complete.

----End

JSON

If you choose **JSON**, JSON logs are split into key-value pairs.

Step 1 Select a typical log event as the sample. Click **Select from existing log events**, select a log event, or enter a log event in the text box, and click **OK**. You can select different time ranges to filter logs.

NOTE

There are three types of time range: relative time from now, relative time from last, and specified time. Select a time range as required.

- From now: queries log data generated in a time range that ends with the current time, such as the previous 1, 5, or 15 minutes. For example, if the current time is 19:20:31 and 1 hour is selected as the relative time from now, the charts on the dashboard display the log data that is generated from 18:20:31 to 19:20:31.
- From last: queries log data generated in a time range that ends with the current time, such as the previous 1 or 15 minutes. For example, if the current time is 19:20:31 and 1 hour is selected as the relative time from last, the charts on the dashboard display the log data that is generated from 18:00:00 to 19:00:00.
- **Specified**: queries log data that is generated in a specified time range.

Step 2 Extract fields. Extract fields from the log event. Extracted fields are shown with their example values.

Click **Intelligent Extraction**. Take the following log event as an example.

Enter the log event in the text box.

```
{"a1": "a1", "b1": "b1", "c1": "c1", "d1": "d1"}
```

NOTE

- The **float** data type has 16 digit precision. If a value contains more than 16 valid digits, the extracted content is incorrect, which affects visualization and quick analysis. In this case, you are advised to change the field type to **string**.
- If the data type of the extracted fields is set to **long** and the log content contains more than 16 valid digits, only the first 16 valid digits are displayed, and the subsequent digits are changed to 0.
- If the data type of the extracted fields is set to **long** and the log content contains more than 21 valid digits, the fields are identified as the **float** type. You are advised to change the field type to **string**.

Check and edit the fields if needed. For details about rules for configuring extracted fields, see **Setting Log Structuring Fields**.

Step 3 Click **Save**. The type of extracted fields cannot be changed after the structuring is complete.

----End

Delimiter

Logs can be parsed by delimiters, such as commas (,), spaces, or other special characters.

Step 1 Select a typical log event as the sample. Click **Select from existing log events**, select a log event, or enter a log event in the text box, and click **OK**. You can select different time ranges to filter logs.

NOTE

There are three types of time range: relative time from now, relative time from last, and specified time. Select a time range as required.

- From now: queries log data generated in a time range that ends with the current time, such as the previous 1, 5, or 15 minutes. For example, if the current time is 19:20:31 and 1 hour is selected as the relative time from now, the charts on the dashboard display the log data that is generated from 18:20:31 to 19:20:31.
- From last: queries log data generated in a time range that ends with the current time, such as the previous 1 or 15 minutes. For example, if the current time is 19:20:31 and 1 hour is selected as the relative time from last, the charts on the dashboard display the log data that is generated from 18:00:00 to 19:00:00.
- **Specified**: queries log data that is generated in a specified time range.

Step 2 Select or customize a delimiter.

NOTE

- For invisible characters, enter hexadecimal characters starting with 0x. The length ranges from 0 to 4 characters. There are 32 invisible characters in total.
- For custom characters, enter 1 to 10 characters, each as an independent delimiter.
- For custom character string, enter 1 to 30 characters as one whole delimiter.

Step 3 Extract fields. Extract fields from the log event. Extracted fields are shown with their example values.

Click **Intelligent Extraction**. Take the following log event as an example.

Enter the log event in the text box.

```
1 5f67944957444bd6bb4fe3b367de8f3d 1d515d18-1b36-47dc-a983-bd6512aed4bd 192.168.0.154
192.168.3.25 38929 53 17 1 96 1548752136 1548752736 ACCEPT OK
```

NOTE

The **float** data type has seven digit precision.

If a value contains more than seven valid digits, the extracted content is incorrect, which affects visualization and quick analysis. In this case, you are advised to change the field type to **string**.

Check and edit the fields if needed. For details about rules for configuring extracted fields, see **Setting Log Structuring Fields**.

Step 4 Click **Save**. The type of extracted fields cannot be changed after the structuring is complete.

----End

Nginx

You can customize the format of access logs by the **log_format** command.

Step 1 Select a typical log event as the sample. Click **Select from existing log events**, select a log event, or enter a log event in the text box, and click **OK**. You can select different time ranges to filter logs.

NOTE

There are three types of time range: relative time from now, relative time from last, and specified time. Select a time range as required.

- From now: queries log data generated in a time range that ends with the current time, such as the previous 1, 5, or 15 minutes. For example, if the current time is 19:20:31 and 1 hour is selected as the relative time from now, the charts on the dashboard display the log data that is generated from 18:20:31 to 19:20:31.
- From last: queries log data generated in a time range that ends with the current time, such as the previous 1 or 15 minutes. For example, if the current time is 19:20:31 and 1 hour is selected as the relative time from last, the charts on the dashboard display the log data that is generated from 18:00:00 to 19:00:00.
- **Specified**: queries log data that is generated in a specified time range.

Step 2 Define the Nginx log format. You can click **Apply Default Nginx Log Format** to apply the default format,

NOTE

In standard Nginx configuration files, the portion starting with **log_format** indicates the log configuration.

Log format

- Default Nginx log format:
```
log_format  main   '$remote_addr - $remote_user [$time_local] "$request" '
                   '$status $body_bytes_sent "$http_referer" '
                   '"$http_user_agent" "$http_x_forwarded_for"';
```
- You can also customize a format. The format must meet the following requirements:
  - Cannot be blank.
  - Must start with **log_format** and contain apostrophes (') and field names.
  - Can contain up to 5000 characters.
  - Must match the sample log event.
  - Any character except letters, digits, underscores (_), and hyphens (-) can be used to separate fields.
  - Must end with an apostrophe (') or an apostrophe plus a semicolon (';).

Step 3 Extract fields. Extract fields from the log event. Extracted fields are shown with their example values.

Click **Intelligent Extraction**. Take the following log event as an example.

Enter the log event in the text box.

```
39.149.31.187 - - [12/Mar/2020:12:24:02 +0800] "GET / HTTP/1.1" 304 0 "-" "Mozilla/5.0 (Windows NT
10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/80.0.3987.132 Safari/537.36" "-"
```

Configure the following Nginx log format in step 2:

```
log_format  main   '$remote_addr - $remote_user [$time_local] "$request" '
                   '$status $body_bytes_sent "$http_referer" '
                   '"$http_user_agent" "$http_x_forwarded_for"';
```

NOTE

- The **float** data type has seven digit precision.
- If a value contains more than seven valid digits, the extracted content is incorrect, which affects visualization and quick analysis. In this case, you are advised to change the field type to **string**.

Check and edit the fields if needed. For details about rules for configuring extracted fields, see **Setting Log Structuring Fields**.

Step 4 Click **Save**. The type of extracted fields cannot be changed after the structuring is complete.

----End

Structuring Template

A structuring template extracts fields from either a customized template or a built-in template.

For details, see **Structuring Templates**.

7.4.3 Structuring Templates

LTS supports two types of structuring templates: system templates and custom templates.

System Templates

You can choose from multiple system templates, but cannot modify the field types in them or delete the fields. For details, see **Table 7-7**.

Step 1 Click **System template** and select a template. A sample log event is displayed for each template.

Step 2 When you select a template, the log parsing result is displayed in the **Template Details** area. Click **Save**.

NOTE

- During log structuring, if a system template is used, the time in the system template is the customized log time.
- Fields of the string type do not support range query using the >, =, or < operators or the "in" syntax. Use asterisks (*) or question marks (?) for fuzzy query. You need to reconfigure the structuring and change the value of this field to a number.

Table 7-7 System template fields

Structuring Method	Field Name	Field Type Can Be Changed	Field Can Be Deleted
ELB structuring template	Defined by ELB.	No	No
VPC structuring template	Defined by VPC.	No	No
CTS structuring template	Keys in JSON log events.	No	No

Structuring Method	Field Name	Field Type Can Be Changed	Field Can Be Deleted
APIG structuring template	Defined by APIG.	No	No
DCS audit logs	Defined by DCS.	No	No
Tomcat	Defined by Tomcat.	No	No
Nginx	Defined by Nginx.	No	No
GAUSSV5	Defined by GAUSSV5.	No	No
DDS audit logs	Defined by DDS.	No	No
DDS error logs	Defined by DDS.	No	No
DDS slow query logs	Defined by DDS.	No	No
CFW access control logs	Defined by CFW.	No	No
CFW attack logs	Defined by CFW.	No	No
CFW traffic logs	Defined by CFW.	No	No
MySQL error logs	Defined by MySQL.	No	No
MySQL slow query logs	Defined by MySQL.	No	No
PostgreSQL slow query logs	Defined by PostgreSQL.	No	No
PostgreSQL error logs	Defined by PostgreSQL.	No	No
SQL Server error logs	Defined by SQL Server.	No	No
GaussDB(for Redis) slow query logs	Defined by GeminiDB Redis.	No	No
SMN	Defined by SMN.	No	No
GAUSSDB_MYSQL error logs	Defined by GaussDB_MySQL.	No	No

Structuring Method	Field Name	Field Type Can Be Changed	Field Can Be Deleted
GaussDB_MySQL slow query logs	Defined by GaussDB_MySQL.	No	No
ER Enterprise Router	Defined by ER.	No	No
MySQL audit logs	Defined by MySQL.	No	No
GaussDB(for Cassandra) slow query logs	Defined by GeminiDB Cassandra.	No	No
GaussDB(for Mongo) slow query logs	Defined by GeminiDB Mongo.	No	No
GaussDB(for Mongo) error logs	Defined by GeminiDB Mongo.	No	No
WAF access logs	Defined by WAF.	No	No
WAF attack logs	Defined by WAF.	No	No
DMS rebalancing logs	Defined by DMS.	No	No
CCE audit logs	Defined by CCE.	No	No
CCE event logs	Defined by CCE.	No	No
GaussDB(for Redis) audit logs	Defined by GeminiDB Redis.	No	No

----End

Custom Templates

Click **Custom template** and select a template. There are two ways to obtain a custom template:

- When you extract fields using methods of regular expression, JSON, delimiter, or Nginx, click **Save as Template** in the lower left corner. In the displayed dialog box, enter the template name and click **OK**. The template will be displayed in the custom template list.

- Create a custom template under the **Structuring Template** option.

  Select **Custom template** and click **Create Template**. Enter a template name, select **Regular Expressions**, **JSON**, **Delimiter**, or **Nginx**, configure the template, and click **Save**. The template will be displayed in the custom template list.

7.4.4 Log Structuring Fields

Restrictions

The maximum size of a structured field value is 16 KB. The excess part will be truncated.

Setting Log Structuring Fields

You can edit extracted fields after log structuring.

Table 7-8 Rules for configuring structured fields

Structuring Method	Field Name	Field Type Can Be Changed	Field Can Be Deleted
Regular expressions (auto generate)	User-defined. The name must start with a letter and contain only letters and digits.	Yes	Yes
Regular expressions (manually enter)	● User-defined. ● Default names such as **field1**, **field2**, and **field3** will be used for unnamed fields. You can modify these names.	Yes	Yes
JSON	Names are set automatically, but you can set aliases for fields.	Yes	Yes
Delimiter	Default names such as **field1**, **field2**, **field3** are used. You can modify these names.	Yes	Yes
Nginx	Names are set based on Nginx configuration, but you can set aliases for fields.	Yes	Yes
Custom templates	User-defined.	Yes	Yes

NOTE

When you use regular expressions (manually entered), JSON, delimiters, Nginx, or custom templates to structure logs, field names:

- Can contain only letters, digits, hyphens (-), underscores (_), and periods (.).
- Cannot start with a period (.) or underscore (_) or end with a period (.).
- Can contain 1 to 64 characters.

Setting Tag Fields

When you structure logs, you can configure tag fields, so you can use these fields to run SQL queries on the **Visualization** page.

Step 1 During field extraction, click the **Tag Fields** tab.

Step 2 Click **Add Field**.

Step 3 In the **Field** column, enter the name of the tag field, for example, **hostIP**.

NOTE

If you configure tag fields for a structuring rule that was created before the function of tag fields was brought online, no example values will be shown with the tag fields.

Step 4 To add more fields, click **Add Field**.

Step 5 Click **Save** to save the settings.

NOTE

- Tag fields can be the following system fields: **category**, **clusterId**, **clusterName**, **containerName**, **hostIP**, **hostId**, **hostName**, **nameSpace**, **pathFile**, and **podName**.
- Tag fields cannot be the following system fields: **groupName**, **logStream**, **lineNum**, **content**, **logContent**, **logContentSize**, and **collectTime**.
- You can configure both field extraction and tag fields during log structuring.

----End

7.5 Search Syntax and Functions

7.5.1 Search Syntax

LTS provides a set of search syntax for setting search criteria, helping you search for logs more effectively.

NOTE

- Before using the search syntax, set the delimiters in **Index Settings**. If there is no special requirement, use the default delimiters **, '";=()[]{}@&<>/:\n\t\r**.
- The search syntax does not support search by delimiter.

  Search statements do not support delimiters. For example, in the search statement **var/log**, **/** is a delimiter. The search statement is equivalent to **var log** and is used to search for all logs that contain both **var** and **log**. Similarly, the search statements such as **"var:log"** and **var;log** are used to search for all logs that contain both **var** and **log**.

Search Mode

The search statement is used to specify the filter criteria for log search and return the logs that meet the filter criteria.

Depending on the index configuration mode, it can be classified into full-text search and field search; according to the search accuracy, it can be classified into exact search and fuzzy search. Other types of search modes include range search and phrase search.

Table 7-9 Search mode description

Search Mode	Description	Example
Full-Text Search	LTS splits an entire log into multiple keywords when full-text index is set. **NOTE** • **content** is a built-in field corresponding to the original log text. The search statement **GET** is equivalent to **content:GET**. By default, the original log content is matched. • By default, multiple keywords are connected through **AND**. The search statement **GET POST** is equivalent to **GET** and **POST**.	• GET POST • GET and POST • content:GET and content:POST The preceding search statements have the same function, indicating that logs containing both GET and POST are searched.
Field Search	Search for specified field names and values (key:value) after field indexing is configured. You can perform multiple types of basic search and combined search based on the data type set in the field index. **NOTE** • The **value** parameter cannot be empty. You can use the **key:""** statement to search for logs with empty field values. • When field search is used together with the **not** operator, logs that do not contain this field are matched.	• **request_time>60 and request_method:po*** indicates that the system searches for logs in which the value of **request_time** is greater than 60 and the value of **request_method** starts with **po**. • **request_method:""** indicates that logs in which the value of **request_method** is empty are searched. • **not request_method:GET** indicates that logs that do not contain the **request_method** field and whose **request_method** value is not **GET** are searched.

Search Mode	Description	Example
Exact Search	Use exact words for search. LTS searches with word segmentation, which does not define the sequence of keywords. **NOTE** If the search statement is abc def, all logs that contain both abc and def are matched. Logs abc def or def abc are matched. To ensure the sequence of keywords, use **#"abc def"**.	● **GET POST** indicates that logs containing both **GET** and **POST** are searched. ● **request_method:GET** indicates that logs in which the value of **request_method** contains **GET** are searched. ● **#"/var/log"** indicates that logs containing phrase **/var/log** are searched.
Fuzzy Search	Specify a word in the search statement and add a fuzzy search keyword, that is, an asterisk (*) or a question mark (?), to the middle or end of the word. LTS searches for the word that meets the search criteria and returns all logs that contain the word. **NOTE** ● The asterisk (*) indicates that multiple characters are matched, and the question mark (?) indicates that one character is matched. ● Words cannot start with an asterisk (*) or a question mark (?). ● Long and float data does not support fuzzy search using asterisks (*) or question marks (?).	● **GE*** indicates that the system searches for words starting with **GE** in all logs and returns logs containing these words. ● **request_method:GE*** indicates that the system searches for **request_method** values starting with **GE** in all logs and returns logs containing these words.
Search Scope	The long and float data supports range search. ● Method 1: Use operators such as = (equal to) > (greater than) < (less than) operators to search for logs. ● Method 2: Use the in operator to search for logs. The open/closed interval can be modified. **NOTE** The string fields do not support range query.	● request_time>=60 indicates that the system searches for logs whose request_time value is greater than or equal to 60. ● request_time in (60 120] indicates that the system searches for logs whose request_time value is greater than 60 and less than or equal to 120.

Search Mode	Description	Example
Phrase Search	Phrase search is used to fully match target phrases in logs to ensure the sequence in which keywords appear. **NOTE** Fuzzy search is not supported for phrase search.	**#"abc def"** indicates that the system searches all logs for the logs that contain the target phrase abc def.

- Delimiters

  LTS splits the log content into multiple words based on delimiters. Default delimiters include **,'";=()[]{}@&<>/:\n\t\r and spaces**.

  For example, the default delimiter divides the log **2023-01-01 09:30:00** into four parts: **2023-01-01**, **09**, **30**, and **00**.

  In this case, the search statement **2023** cannot match the log. You can search for the log using **2023-01*** or **2023-01-01**.

  If the delimiter is set to null, the field value is regarded as a whole. You can search for the corresponding log only through complete log content or fuzzy search.

- Keyword sequence

  Only the phrase search **#"abc def"** can ensure the sequence of keywords. In other search modes, multiple keywords are connected by AND.

  For example, **request_method:GET POST** is used to query logs that contain both GET and POST, and the sequence of GET and POST is not ensured. **Phrase search** is recommended.

- Chinese search

  Fuzzy search is not required for Chinese search. Phrase search is recommended to match more accurate results.

  In LTS, English content is split into words of different lengths. Therefore, you can use fuzzy search to match logs with English words with the same prefix.

  Unigram segmentation is used to a Chinese string into Chinese characters. Each Chinese character is independent, and the length of each part is 1 character.

  For example, the search statement **Monday** indicates that logs containing M, o, n, d, a, and y are searched. The search statement **#"Monday"** indicates that logs containing the target phrase **Monday** are searched.

- Invalid keyword

  The syntax keywords of log search statements include: && || AND OR and or NOT not in : > < = ( ) [ ]

  When **and AND or OR NOT not in** are used as syntax keywords, separate them with a space.

  If the log contains syntax keywords and needs to be searched, the search statement must be enclosed in double quotation marks. Otherwise, syntax errors may occur or incorrect results may be found.

For example, if the search statement **content:and** contains the syntax keyword **and**, change it to **content:"and"**.

Operator

The search statement supports the following operators:

NOTE

- Except the in operator, other operators are case-insensitive.
- The priorities of operators in descending order are as follows:
  1. Colon (:)
  2. Double quotation marks ("")
  3. Parentheses: ()
  4. and, not
  5. or

Table 7-10 Description

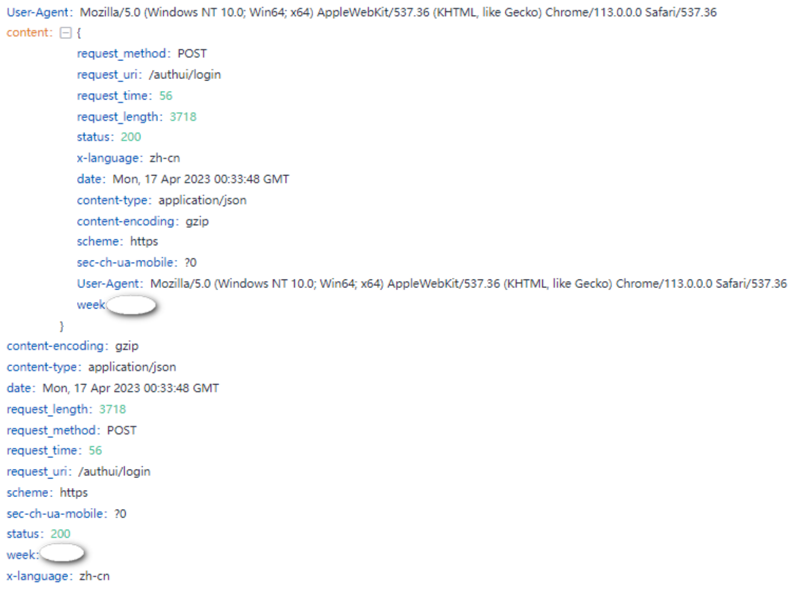
Operator	Description
and	AND operator. If there is no syntax keyword between multiple keywords, the AND relationship is used by default. For example, **GET 200** is equivalent to **GET and 200**. **NOTE** When and is used as an operator, use a space before and after it. For example, **1 and 2** indicates that logs containing both **1** and **2** are searched, and **1and2** indicates that logs containing **1and2** are searched.
AND	AND operator, equivalent to and.
&&	AND operator. **NOTE** When && is used as an operator, spaces are not necessary. For example, **1 && 2** is equivalent to **1&&2**, indicating that logs containing both **1** and **2** are searched.
or	OR operator, example: **request_method:GET or status:200** **NOTE** When or is used as an operator, use a space before and after it.
OR	OR operator, equivalent to or.
||	OR operator. When || is used as an operator, spaces are not necessary.
not	NOT operator. Example: **request_method:GET not status:200, not status:200** **NOTE** ● When not is used as an operator, use a space before and after it. ● When field search is used together with the not operator, logs that do not contain this field are matched.

Operator	Description
( )	Specify fields that should be matched with higher priority. Example: **(request_method:GET or request_method:POST) and status:200**
:	Search for a specified field (key:value). For example, **request_method:GET**. **NOTE** Use double quotation marks ("") to enclose a field name (key) or value that contains reserved characters, such as spaces and colons (:). Examples: ● **"request method":GET** ● **message:"This is a log"** ● **time:"09:00:00"** ● **ipv6:"2024:AC8:2ac::d09"**
""	Enclose a syntax keyword to convert it into common characters. For example, "and" means searching for logs that contain this word. The word and here is not an operator.
\	Escape double quotation marks (""). The escaped quotation marks indicate the symbol itself. For example, to search for **instance_id:nginx"01"**, use **instance_id:nginx\"01\"**.
*	An asterisk can match zero, single, or multiple characters. Example: **request_method:P*T** **NOTE** Put it in the middle or at the end of a keyword.
?	A question mark matches a single character. For example, **request_method:P?T** can match PUT but cannot match POST. **NOTE** Put it in the middle or at the end of a keyword.
>	Searches logs in which the value of a field is greater than a specified value. Example: **request_time>100**
>=	Searches logs in which the value of a field is greater than or equal to a specified value. Example: **request_time>=100**
<	Searches logs in which the value of a field is less than a specified value. Example: **request_time<100**
<=	Searches logs in which the value of a field is less than or equal to a specified value. Example: **request_time<=100**
=	Searches logs in which the value of a field is equal to a specified value, applying only to float or long fields. For fields of this type, the equal sign (=) and colon (:) have the same function. For example, **request_time=100** is equivalent to **request_time:100**.

Operator	Description
in	Search logs whose field values are in a specified range. Brackets indicate a closed interval, and parentheses indicate an open interval. Numbers are separated with spaces. Example: **request_time in [100 200]** and **request_time in (100 200]** **NOTE** Enter **in** in lowercase. When it is used as an operator, use a space before and after it.
#""	Searches for logs that contain the target phrase, ensuring the sequence of keywords. **NOTE** The asterisk (*) and question mark (?) in phrase search are regarded as common characters. Therefore, phrase search does not support fuzzy search and can be used to search for the asterisk (*) and question mark (?) in logs.

Search Statement Examples

For the same search statement, different search results are displayed for different log content and index configurations. This section describes search statement examples based on the following log examples and indexes:



```
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/113.0.0.0 Safari/537.36
content: ⊟ {
        request_method: POST
        request_uri: /authui/login
        request_time: 56
        request_length: 3718
        status: 200
        x-language: zh-cn
        date: Mon, 17 Apr 2023 00:33:48 GMT
        content-type: application/json
        content-encoding: gzip
        scheme: https
        sec-ch-ua-mobile: ?0
        User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/113.0.0.0 Safari/537.36
        week[redacted]
      }
content-encoding: gzip
content-type: application/json
date: Mon, 17 Apr 2023 00:33:48 GMT
request_length: 3718
request_method: POST
request_time: 56
request_uri: /authui/login
scheme: https
sec-ch-ua-mobile: ?0
status: 200
week:[redacted]
x-language: zh-cn
```

Table 7-11 Search statement examples

Search Requirement	Search Statement
Logs of POST requests whose status code is 200	request_method:POST and status=200

Search Requirement	Search Statement
Logs of successful GET or POST requests (status codes 200 to 299)	(request_method:POST or request_method:GET) and status in [200 299]
Logs of failed GET or POST requests	(request_method:POST or request_method:GET) not status in [200 299]
Logs of non-GET requests	not request_method:GET
Logs of successful GET request and request time is less than 60 seconds	request_method:GET and status in [200 299] not request_time>=60
Logs whose request time is 60 seconds.	● request_time:60 ● request_time=60
Logs of requests whose time is greater than or equal to 60 seconds and less than 200 seconds	● request_time>=60 and request_time<200 ● request_time in [60 200)
Logs that contain and	content:"and" **NOTE** Double quotation marks are used to enclose and. and is a common string and does not represent an operator.
Logs that do not contain the user field.	not user:*
Logs in which the value of **user** is empty are searched.	user:""
Logs in which the value of the week field is not Monday	not week: Monday
Logs whose sec-ch-ua-mobile field is ?0	sec-ch-ua-mobile:#"?0" **NOTE** If search is required when log content contains asterisks (*) or question marks (?), use phrases search.

The following describes examples of advanced searches.

Table 7-12 Fuzzy Search

Search Requirement	Search Statement
Logs that contain words starting with GE	GE*

Search Requirement	Search Statement
Logs that contain words starting with GE and with only one character after GE.	GE?
Logs in which the value of request_method contains a word starting with G.	request_method:G*
Logs in which the value of request_method starts with P, ends with T, and contains a single character in the middle.	request_method:P?T
Logs in which the value of request_method starts with P, ends with T, and contains zero, single, or multiple characters in the middle.	request_method:P*T

Search based on delimiters. For example, the value of the User-Agent field is **Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/113.0.0.0 Safari/537.36**.

- If this parameter is left blank, the value of this field is considered as a whole. In this case, when you use **User-Agent:Chrome** to search for logs, no log can be found.
- When the delimiter is set to **, '";=()[]{}?@&<>/:\n\t\r**, the value of this field is split into **Mozilla**, **5.0**, **Windows**, **NT**, **10.0**, **Win64**, **x64**, **AppleWebKit**, **537.36**, **KHTML**, **like**, **Gecko**, **Chrome**, **113.0.0.0**, **Safari**, and **537.36**.

  Then you can use search statements such as **User-Agent:Chrome** for search.

Table 7-13 Delimiter-based search

Search Requirement	Search Statement
Logs in which the value of User-Agent contains Chrome	User-Agent:Chrome
Logs in which the value of User-Agent contains the word starting with Win	User-Agent:Win*
Logs in which the value of User-Agent contains Chrome and Linux	User-Agent:"Chrome Linux"
Logs in which the value of User-Agent contains Firefox or Chrome	User-Agent:Chrome OR User-Agent:Linux
Logs in which the value of User-Agent contains Chrome but not Linux	User-Agent:Chrome NOT User-Agent:Linux

7.5.2 Phrase Search

Phrase search is used to precisely match the target phrase. For example, the search statement **abc def** matches all logs that contain both **abc** and **def** regardless of the sequence. For details about the differences between phrase search and keyword search, see **Table 7-14**.

- Phrase search: It is implemented based on the keyword search syntax. Phrase search can distinguish the sequence of keywords and is used to accurately match target phrases, making the search result more accurate. Phrase search is applicable to English phrases and Chinese phrases, but cannot be used together with fuzzy search.
- Keyword search: Keyword search is implemented based on word segmentation. Delimiters are used to split the search content into multiple keywords for log matching. Keyword search does not distinguish the sequence of keywords. Therefore, as long as a keyword can be matched in a log based on the AND or NOT logic, the log can be found.

Table 7-14 Differences between two search modes

Search Mode	Phrase Search	Keyword Search
Differences	Distinguishes the sequence of keywords and is used to accurately match target phrases, making the search result more accurate.	Does not distinguish the sequence of keywords. The keyword is matched based on the search logic.
Examples	Assume that your log stream contains the following two raw logs: ● Raw log 1: **this service is lts** ● Raw log 2: **lts is service**	
	If you search for the phrase **#"is lts"**, one log is matched.	If you search for the keyword **is lts**, two logs are matched.
	If you search for the phrase **#"lts is"**, one log is matched.	If you search for the keyword **lts is**, two logs are matched.

Search Syntax

Table 7-15 Search Mode

Search Mode	Description
Full-text search	● #"abc def" ● content:#"abc def" **NOTE** **content** is a built-in field corresponding to the original log text. **#"abc def"** is equivalent to **content:#"abc def"** and matches the original log content by default.
Field Search	key:#"abc def" **NOTE** ● The value cannot be empty. ● When field search is used together with the not operator, logs that do not contain this field are matched.

Restrictions

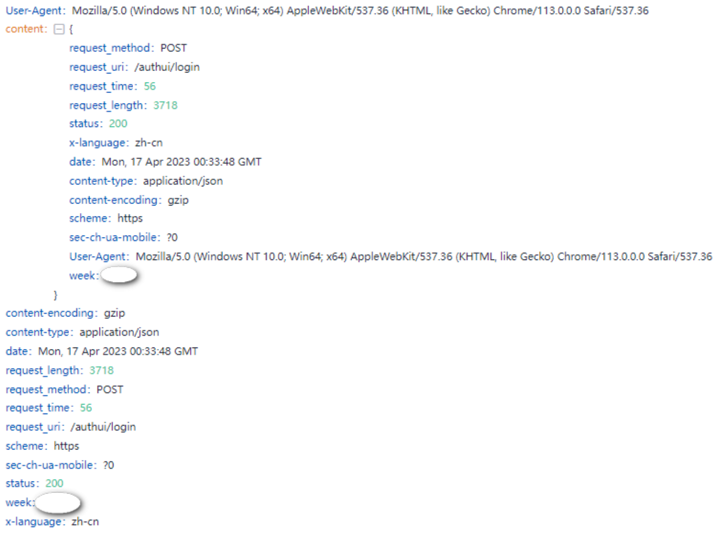
- Fuzzy search cannot be used together with phrase search.

  The asterisk (*) and question mark (?) in phrase search are regarded as common characters. Therefore, phrase search does not support fuzzy search and can be used to search for the asterisk (*) and question mark (?) in logs.
- Phrase search does not support search by delimiter.

  For example, in the search statement **#"var/log"**, **/** is a delimiter. The search statement is equivalent to **#"var log"**, and is used to search for logs containing the target phrase **var log**. Similarly, search statements such as **#"var:log"** and **#"var;log"** are used to search for logs that contain the target phrase **var log**.
- Phrase search is recommended for search in Chinese.

  By default, unary word segmentation is used for Chinese characters. Each Chinese character is segmented separately. During the search, logs that contain each Chinese character in the search statement are matched, which is similar to fuzzy search. When more accurate results are required, phrase search is recommended.

Example



```
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/113.0.0.0 Safari/537.36
content: ⊟ {
        request_method: POST
        request_uri: /authui/login
        request_time: 56
        request_length: 3718
        status: 200
        x-language: zh-cn
        date: Mon, 17 Apr 2023 00:33:48 GMT
        content-type: application/json
        content-encoding: gzip
        scheme: https
        sec-ch-ua-mobile: ?0
        User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/113.0.0.0 Safari/537.36
        week:
      }
content-encoding: gzip
content-type: application/json
date: Mon, 17 Apr 2023 00:33:48 GMT
request_length: 3718
request_method: POST
request_time: 56
request_uri: /authui/login
scheme: https
sec-ch-ua-mobile: ?0
status: 200
week:
x-language: zh-cn
```

Table 7-16 Search description

Search Requirement	Search Statement
Logs in which the value of User-Agent contains the phrase Mon, 17 Apr 2023.	User-Agent:#"Mon, 17 Apr 2023"
Logs in which the value of User-Agent contains the phrase Mozilla/5.0.	User-Agent:#"Mozilla/5.0"
Logs in which the value of week contains the phrase Monday.	week:#"Monday"

7.5.3 Viewing Real-Time Logs

You can view reported logs on the LTS console in real time.

Prerequisites

- You have created log groups and log streams.
- You have installed **ICAgent**.
- You have configured log collection rules.

Procedure

1. On the LTS console, click **Log Management**.
2. In the log group list, click ⌄ on the left of a log group name.
3. In the log stream list, click the name of the target log stream.
4. Click the **Real-Time Logs** tab to view the real-time logs.

NOTE

Filter host and K8s logs by source.

- If **Source** is set to **Host**, set the host IP address and file path.
- If **Source** is set to **K8s**, set the instance name, container name, and file path.
- **Filter**: Obtain data from the index configuration, structuring configuration, and latest logs.

Logs are reported to LTS once every minute. You may wait for at most 1 minute before the logs are displayed.

In addition, you can customize log display by clicking **Clear** or **Pause** in the upper right corner.

- **Clear**: Displayed logs will be cleared from the real-time view.
- **Pause**: Loading of new logs to the real-time view will be paused.

  After you click **Pause**, the button changes to **Continue**. You can click **Continue** to resume the log loading to the real-time view.

NOTE

Stay on the **Real-Time Logs** tab to keep updating them in real time. If you leave the **Real-Time Logs** tab page, logs will stop being loaded in real time. The next time you access the tab, the logs that were shown before you left the tab will not be displayed.

7.5.4 Quick Analysis

Monitoring keywords in logs helps you keep track of system performance and services. For example, the number of **ERROR** keywords indicates the system health, and the number of **BUY** keywords indicates the sales volume. LTS provides quick analysis for you to obtain statistics on your specified keywords.

Prerequisites

Quick analysis is conducted on fields extracted from structured logs. **Structure** raw logs before you create a quick analysis task.

Creating a Quick Analysis Task

You can enable **Quick Analysis** for the fields on the **Log Structuring** page. You can also perform the following steps to create a quick analysis task:

Step 1 Log in to the LTS console. In the navigation pane on the left, choose **Log Management**.

Step 2 A quick analysis is performed on a log stream. Select the target log group and log stream on the **Log Management** page.

Step 3 You can create a quick analysis task in either of the following ways:

1. Click ⚙ to go to the setting details page. Under **Index Fields**, enable **Quick Analysis** when adding a field.
2. On the **Cloud Structuring Parsing** tab page, enable **Auto Configuration and Analysis**. It is enabled by default. This enables structured fields for configuring indexes and quick analysis.

Step 4 On the **Raw Logs** tab page, click **Set Quick Analysis**. On the displayed **Index Settings** tab page, add fields for quick analysis.

Step 5 Click **OK**. The quick analysis task is created.

NOTE

- abc indicates a field of the **string** type.
- 1.2 indicates a field of the **float** type.
- 123 indicates a field of the **long** type.
- The maximum length of a field for quick analysis is 2,000 bytes.
- The quick analysis field area displays the first 100 records.

----End

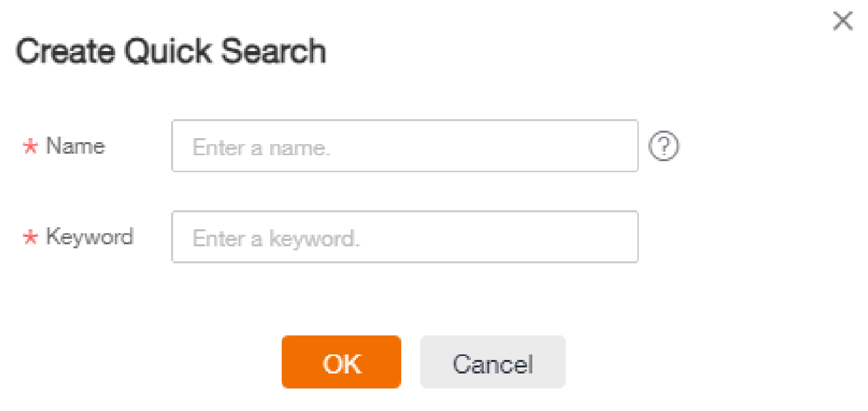
7.5.5 Quick Search

To search for logs using a keyword repeatedly, perform the following operations to configure quick search.

Procedure

1. On the LTS console, choose **Log Management** in the navigation pane on the left.
2. In the log group list, click ⌄ on the left of a log group name.
3. In the log stream list, click the name of the target log stream.
4. Click the **Raw Logs** tab, click 💾 , and specify **Name** and **Keyword**.

Figure 7-1 Creating quick search



– A quick search name is used to distinguish multiple quick search statements. The name can be customized and must meet the following requirements:

  ▪ Can contain only letters, digits, hyphens (-), underscores (_), and periods (.).

        - Cannot start with a period (.) or underscore (_) or end with a period (.).
        - Can contain 1 to 64 characters.
    - A quick search statement is used to repeatedly search for logs, for example, **error***.
5. Click **OK**.

   Click the name of a quick search statement to view log details.

Viewing Context of a Log

You can check the logs generated before and after a log for quick fault locating.

1. On the **Raw Logs** tab of the log details page, click 🔍 to view the context.

   The context of the log is displayed.
2. On the displayed **View Context** page, check the log context.

Table 7-17 Introduction to log context viewing

Feature	Description
Search Rows	Number of lines queried.
Highlighting	Enter a string to be highlighted and press **Enter**.
Filter	Enter a string to be filtered and press **Enter**. When both **Highlighting** and **Filter** are configured, the filtered string can also be highlighted.
Fields	The default field for viewing log context is **content**. Click **Fields** to view the context of other fields.
Prev	View half the number of **Search Rows** leading to the current position. For example, if **Search Rows** is set to 100 and you click **Prev**, 50 rows prior to the current position are displayed. In this case, the current line number is **-50**. If you click **Prev** again, the line number will become **-100**, **-150**, **-200**, and so on.
Current	Current log position. When **Prev** or **Update** is set, you can click **Current** to return to the position where the context starts (when the line number is 0).
Update	View half the number of **Search Rows** following the current position. For example, if **Search Rows** is set to 100 and you click **Update**, 50 rows following the current position are displayed. In this case, the current line number is 50. If you click **Update** again, the line number will become **100**, **150**, **200**, and so on.
Summary Mode	If this mode is enabled, only the line number and content are displayed. If this mode is disabled, log details are displayed.

8 Log Alarms

8.1 Alarm Rules

8.1.1 Configuring Keyword Alarm Rules

LTS allows you to collect statistics on log keywords and set alarm rules to monitor them. By checking the number of keyword occurrences in a specified period, you can have a real-time view of the service running. Currently, up to 200 keyword alarms can be created for each account.

Prerequisites

You have created log groups and log streams.

Creating an Alarm Rule

Step 1 Log in to the LTS console, and choose **Alarms** in the navigation pane on the left.

Step 2 Click the **Alarm Rules** tab.

Step 3 Click **Create**. The **Create Alarm Rule** right panel is displayed.

Step 4 Configure an alarm rule.

Table 8-1 Parameters for setting a keyword alarm condition

Category	Parameter	Description
Basic Info	Rule Name	Name of the alarm rule. Enter 1 to 64 characters and do not start or end with a hyphen (-) or underscore (_). Only letters, digits, hyphens, and underscores are allowed. **NOTE** After an alarm is created, the rule name can be modified. After the modification, move the cursor over the rule name to view the new and original rule names. The original rule name created for the first time cannot be changed.
	Description	Rule description. Enter up to 64 characters.
Statistical analysis	Statistics	**By keyword**: applicable to scenarios where keywords are used to search for and configure log alarms.
	Query condition	**Log Group Name**: Select a log group.
		Log Stream Name: Select a log stream. **NOTE** If a log group contains more than one log stream, you can select multiple log streams when creating a keyword alarm rule.
		Query Time Range: Specify the query period of the statement. It is one period earlier than the current time. For example, if **Query Time Range** is set to one hour and the current time is 9:00, the period of the query statement is 8:00–9:00. ● The value ranges from 1 to 60 in the unit of minutes. ● The value ranges from 1 to 24 in the unit of hours.
		Keywords: Enter keywords that you want LTS to monitor in logs. Exact and fuzzy matches are supported. A keyword is case-sensitive and contains up to 1024 characters.

Category	Parameter	Description
	Check Rule	Configure a condition that will trigger the alarm. **Matching Log Events**: When the number of log events that contain the configured keywords reaches the specified value, an alarm is triggered. Four comparison operators are supported: greater than (**>**), greater than or equal to (**>=**), less than (**<**), and less than or equal to (**<=**). The number of queries refers to the **Query Frequency** set in **Advanced Settings** and the number of times the condition must be met to trigger the alarm. The number of queries must be greater than or equal to the number of times the condition must be met. **NOTE** ● The alarm severity can be **critical** (default), **major**, **minor**, or **info**. ● Number of queries: 1–10

Category	Parameter	Description
Advanced Settings	Query Frequency	The options for this parameter are: ● **Hourly**: The query is performed at the top of each hour. ● **Daily**: The query is run at a specific time every day. ● **Weekly**: The query is run at a specific time on a specific day every week. ● **Custom interval**: You can specify the interval from 1 minute to 60 minutes or from 1 hour to 24 hours. For example, if the current time is 9:00 and the **Custom interval** is set to 5 minutes, the first query is at 9:00, the second query is at 9:05, the third query is at 9:10, and so on. **NOTE** When the query time range is set to a value larger than 1 hour, the query frequency must be set to every 5 minutes or a lower frequency. ● **CRON**: CRON expressions support schedules down to the minute and use 24-hour format. Examples: – **0/10 * * * ***: The query starts from 00:00 and is performed every 10 minutes. That is, queries start at 00:00, 00:10, 00:20, 00:30, 00:40, 00:50, 01:00, and so on. For example, if the current time is 16:37, the next query is at 16:50. – **0 0/5 * * ***: The query starts from 00:00 and is performed every 5 hours at 00:00, 05:00, 10:00, 15:00, 20:00, and so on. For example, if the current time is 16:37, the next query is at 20:00. – **0 14 * * ***: The query is performed at 14:00 every day. – **0 0 10 * ***: The query is performed at 00:00 on the 10th day of every month.
Advanced Settings	Send notification	Enable or disable alarm notification. If you enable **Send notification**, you need to select a Simple Message Notification (SMN) topic, time zone, and language. You can select multiple topics.

Step 5 Click **OK**. The keyword alarm rule is created.

You can also choose **Log Management** in the navigation pane, and select a log stream. On the **Raw Logs** tab page displayed, click ⚙ in the upper right corner, and click **Alarms Rules** to create an alarm rule.

NOTE

After an alarm rule is created, its status is **Enabled** by default. After the alarm rule is disabled, the alarm status is **Disabled**. After the alarm rule is disabled temporarily, the alarm status is **Temporarily closed to May 30, 2023 16:21:24.000 GMT+08:00**. (The time is for reference only.)

When the alarm rule is enabled, an alarm will be triggered if the alarm rule is met. When the alarm rule is disabled, an alarm will not be triggered even if the alarm rule is met.

----End

Follow-up Operations on Alarm Rules

- You can perform the following operations on a single alarm rule.

  Modifying an alarm rule: Click ✎ in the **Operation** column of the row that contains the target alarm rule and modify parameters according to **Table 8-1**. You can modify the rule name. After the modification is complete, move the cursor over the rule name. The new and original rule names are displayed. The original rule name created for the first time cannot be changed.

  Enabling an alarm rule: Click ▷ in the **Operation** column of the row that contains the target alarm rule. (The enabling button is displayed only after the alarm rule is disabled.)

  Disabling an alarm rule: Click ⊗ in the **Operation** column of the row that contains the target alarm rule. (The disabling button is displayed only after the alarm rule is enabled.)

  Temporarily disabling the alarm rule: Click ⏰ in the **Operation** column of the row that contains the target alarm rule and set the end time for temporarily disabling the alarm rule.

  Copying an alarm rule: Click ⧉ in the **Operation** column of the row that contains the target alarm rule.

  Deleting an alarm rule: Click 🗑 in the **Operation** column of the row that contains the target alarm rule, and click **OK**.

- After selecting multiple alarm rules, you can perform the following operations on the alarms: **Open**, **Close**, **Disable Temporarily**, **Re-Enable**, **Enable Clearance**, **Disable Clearance**, and **Delete**.

8.2 Viewing Alarms

You can configure keyword alarm rules to query and monitor log data. When alarm rules are met, alarms will be triggered. You can view the alarms on the LTS console.

Prerequisites

You have created an alarm rule.

Procedure

Step 1 Log in to the LTS console, and choose **Alarms** in the navigation pane.

Step 2 Click the **Alarms** tab. The alarms generated in 30 minutes from now and their trend charts are displayed by default.

Step 3 Set criteria to search for your target alarms.

- In the search box in the upper part of the page, select a log group, log stream, and alarm severity.
- Set a time range. By default, 30 minutes is specified (relative time from now).

  There are three types of time range: relative time from now, relative time from last, and specified time. Select a time range as required.

  NOTE

  - From now: queries log data generated in a time range that ends with the current time, such as the previous 1, 5, or 15 minutes. For example, if the current time is 19:20:31 and 1 hour is selected as the relative time from now, the charts on the dashboard display the log data that is generated from 18:20:31 to 19:20:31.
  - From last: queries log data generated in a time range that ends with the current time, such as the previous 1 or 15 minutes. For example, if the current time is 19:20:31 and 1 hour is selected as the relative time from last, the charts on the dashboard display the log data that is generated from 18:00:00 to 19:00:00.
  - **Specified**: queries log data that is generated in a specified time range.

Step 4 Click 🔍 after you set the search criteria. The details and trend of the alarms that match the criteria will be displayed.

Step 5 You can point to the **Details** column of an alarm on the **Active Alarms** tab to view the complete alarm details. Alternatively, click the name in the **Alarm Name** column of an alarm. Details about the alarm are displayed in the right panel that pops up.

After the reported fault is rectified, you can click the deletion button in the row that contains the corresponding alarm on the **Active Alarms** tab to clear the alarm. The cleared alarm will then be displayed on the **Historical Alarms** tab.

If you have configured search criteria to filter alarms, you need to manually refresh the alarm list. To enable automatic refresh, click ▾ in the upper right corner and select **Refresh Every 30s**, **Refresh Every 1m**, or **Refresh Every 5m** from the drop-down list box. You can still manually refresh the alarm list when automatic refresh is enabled by selecting **Refresh Now** from the drop-down list box.

----End

9 Log Transfer

9.1 Overview

Logs reported from hosts and cloud services are retained in LTS. You can set the retention period. Retained logs are deleted once the retention period is over. For long-term retention, you can transfer logs to other cloud services.

> **NOTE**
>
> Log transfer refers to when logs are replicated to other cloud services. Retained logs are deleted once the retention period is over, but the logs that have been transferred to other services are not affected.

9.2 Transferring Logs to OBS

You can transfer logs to OBS and download log files from the OBS console.

> **NOTE**
>
> To transfer logs, you must have the **OBS Administrator** permissions apart from the LTS permissions.

Prerequisites

- Logs have been ingested to LTS.
- You have created an OBS bucket.

Creating a Log Transfer Task

Step 1 Log in to the LTS console and choose **Log Transfer** in the navigation pane on the left.

Step 2 Click **Configure Log Transfer** in the upper right corner.

Step 3 On the displayed page, configure the log transfer parameters.

Table 9-1 Transfer parameters

Parameter	Description	Example Value
Enable Transfer	Enabled by default.	Enabled
Transfer Destination	Select a cloud service for log transfer.	OBS
Log Group Name	Select a log group.	N/A
Log Stream Name	Select a log stream. **NOTE** Log streams that have been configured with OBS transfer settings cannot be configured again.	-
OBS Bucket	● Select an OBS bucket. – If no OBS buckets are available, click **View OBS Bucket** to access the OBS console and create an OBS bucket. ● Currently, LTS supports only **Standard** OBS buckets. **NOTE** If you select an unauthorized OBS bucket, LTS will take 15 minutes to authorize the ACL for the bucket. If your configuration fails, try again 15 minutes later. To prevent log transfer failures, exercise caution when modifying bucket policies.	-

Parameter	Description	Example Value
Custom Log Transfer Path	● Enabled: Logs will be transferred to a custom path to separate transferred log files of different log streams. The format is **/LogTanks/***Region name/Custom path*. The default custom path is **lts/%Y/%m/%d**, where **%Y** indicates the year, **%m** indicates the month, and **%d** indicates the day. A custom path must meet the following requirements: – Must start with **/LogTanks/***Region name*. – Can contain only letters, digits, and the following special characters: &$@;:,=+?-._/ %. The character % can only be followed only by Y (year), m (month), d (day), H (hour), and M (minute). Any number of characters can be added before and after %Y, %m, %d, %H, and %M, and the sequence of these variables can be changed. – Can contain 1–128 characters. Example: 1. If you enter **LTS-test/%Y/%m/%done/%H/%m**, the path is **LogTanks**/*Region name*/**LTS-test**/*Y*/*m*/*d***one**/*H*/*m*/*Log file name*. 2. If you enter **LTS-test/%d/%H/%m/%Y**, the path is **LogTanks**/*Region name*/**LTS-test**/*d*/*H*/*m*/*Y*/*Log file name*. ● Disabled: Logs will be transferred to the default path. The default path is **LogTanks/***Region name/2019/01/01/Log group/Log stream/Log file name*.	LTS-test/%Y/%m/%done/%H/%m
Log Prefix	The file name prefix of the log files transferred to an OBS bucket The prefix must meet the following requirements: ● Can contain 0 to 64 characters. ● Can contain only letters, digits, hyphens (-), underscores (_), and periods (.). Example: If you enter **LTS-log**, the log file name will be **LTS-log_***Log file name*.	LTS-log

Parameter	Description	Example Value

Format	The storage format of logs. The value can be **Raw Log Format** or **JSON**.
	● Examples of the raw log format: (Logs displayed on the LTS console are in the raw format.)
	`Sep 30 07:30:01 ecs-bd70 CRON[3459]: (root) CMD (/opt/oss/servicemgr/ICAgent/bin/manual/mstart.sh > /dev/null 2>&1)`
	● The following is an example of the JSON format:
	`{"host_name":"ecs-bd70","ip":"192.168.0.54","line_no":249,"message":"Sep 30 14:40:01 ecs-bd70 CRON[4363]: (root) CMD (/opt/oss/servicemgr/ICAgent/bin/manual/mstart.sh > /dev/null 2>&1)\n","path":"/var/log/syslog","time":1569825602303}`
		Json

Log Transfer Interval	The interval for automatically transferring logs to OBS buckets. The value can be 2, 5, or 30 minutes, or 1, 3, 6, or 12 hours.	3 hours
Time Zone	When logs are transferred to OBS buckets, the time in the transfer directory and file name will use the specified UTC time zone.	(UTC) Coordinated Universal Time
Filter by Tag Fields	During transfer, logs will be filtered by tag fields collected by ICAgent. ● Disabled: Logs will not be filtered by tag fields. ● Enabled: Default tag fields include those for hosts (**hostIP**, **hostId**, **hostName**, **pathFile**, and **collectTime**) and for Kubernetes (**clusterName**, **clusterId**, **nameSpace**, **podName**, **containerName**, and **appName**). Optional public tag fields are **regionName**, **logStreamName**, **logGroupName**, and **projectId**. **NOTE** When **Filter by Tag Fields** is enabled, **Format** must be **JSON**. ● **Filter by Tag Fields**: When this parameter is enabled, logs will be filtered by tags.	Enabled

Step 4 Click **OK**. When the log transfer status changes to **Normal**, the transfer task has been created.

Step 5 Click the OBS bucket name in the **Transfer Destination** column to switch to the OBS console and view the transferred log files.

Transferred logs can be downloaded from OBS to your local computer for viewing.

NOTE

Logs stored in OBS are in raw or JSON format.

----End

Modifying a Log Transfer Task

1. Locate the row that contains the target transfer task and click **Modify** in the **Operation** column.
2. Click **OK**.

Viewing Transfer Details

1. Locate the target log transfer task and click **More** > **Details** in the row of the desired task to view its details.
2. On the displayed **Transfer Details** page, you can view the log transfer details.

Deleting a Log Transfer Task

If logs do not need to be transferred, you can delete the transfer task.

NOTE

- After a transfer task is deleted, log transfer will be stopped. Exercise caution when performing the deletion.
- After a transfer task is deleted, the logs that have been transferred remain in OBS.
- When you create a transfer task, OBS will grant read and write permissions to LTS for the selected bucket. If one OBS bucket is used by multiple transfer tasks, perform the following operations to delete the transfer task:
  - If only one transfer task is created using this OBS bucket, delete the bucket access permission granted to specific users on the **Access Control** > **Bucket ACLs** tab page on the OBS console when you delete the transfer task.
  - If multiple transfer tasks are created using this OBS bucket, do not delete the bucket access permission. Otherwise, data transfer will fail.

1. Locate the row of the target transfer task and choose **Delete** in the **Operation** column.
2. Click **OK**.

Viewing Transfer Status

The status of a transfer task can be **Normal**, **Abnormal**, or **Disabled**.

- **Normal**: The log transfer task works properly.
- **Abnormal**: An error occurred in the log transfer task. The possible causes are as follows:
  - The OBS bucket has been deleted. Specify another OBS bucket.
  - Access control on the OBS bucket is configured incorrectly. Access the OBS console to correct the settings.
- **Disabled**: The log transfer task is stopped.

10 Configuration Center

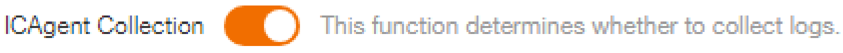
10.1 Log Collection

To reduce the memory, database, and disk space usage, you can set log collection as required. The log collection switch is used to determine whether to collect log data.

Step 1 Log in to the LTS console, choose **Configuration Center** in the navigation pane on the left, and click the **ICAgent Collection** tab.

Step 2 Enable or disable **ICAgent Collection**.

Figure 10-1 Enabling or disabling log collection



ICAgent Collection
This function determines whether to collect logs.

NOTE

This function is enabled by default. If you do not need to collect logs, disable this function to reduce resource usage.

After the log collection function is disabled, ICAgent will stop collecting logs, and this function on the AOM console will also be disabled.

----End

11 FAQs

11.1 Installing ICAgent

11.1.1 What Can I Do If the ICAgent Upgrade Fails?

If you failed to upgrade ICAgent on the LTS console, log in to the VM and run the ICAgent installation command. ICAgent can be overwrite-installed, eliminating the need to uninstall it before reinstallation.

11.1.2 What Can I Do If ICAgent Is Displayed As Offline After Being Installed?

If ICAgent is offline, the possible cause is that ICAgent is abnormal because Access Key ID/Secret Access Key (AK/SK) pair is incorrect. Obtain the correct AK/SK and install them again. For details, see **How Do I Obtain an AK/SK Pair?**.

11.1.3 What Can I Do If a Host with ICAgent Installed Is Not Displayed?

If a host with ICAgent installed is not displayed on the **Hosts** tab page on the LTS console, perform the following steps:

Prerequisites

You have logged in to the LTS console.

Procedure

1. When configuring ECS log ingestion, if the ECS is not displayed on the **Hosts** tab page after you install ICAgent on it:
   a. On the **Install ICAgent** page, ensure that the installation command is correctly copied. Do not use the installation command across regions.
   b. Ensure that the obtained AK/SK pair is correct and has not been deleted.

c. Run the **netstat -nap | grep icagent** command to check whether the host network is proper.

2. When configuring CCE log ingestion, if the CCE cluster is not displayed on the **Hosts** tab page after you install ICAgent on it:

   Ensure that ICAgent has been installed in the CCE cluster and a host group with custom identifiers has been created for related nodes. If ICAgent has not been installed, upgrade it on the **Host Management** page.

11.2 Log Collection

11.2.1 What Can I Do If the CPU Usage Is High When ICAgent Is Running?

If the CPU usage is high when ICAgent is running, check whether there are a large number of logs in the log collection path. Clear logs regularly to reduce system resource occupation during log collection.

11.2.2 What Kind of Logs and Files Can LTS Collect?

Logs That Can Be Collected by LTS:

- Host logs. ICAgent should be installed on the target hosts for log collection.
- Cloud service logs. To collect logs from cloud services enable log reporting to LTS in the cloud services.

Files That Can Be Collected by LTS:

If the collection path is set to a directory, for example, **/var/logs/**, only .log, .trace, and .out files in the directory are collected. If the collection path is set to the name of a file (only text files are supported), the specified file is collected. Note that LTS only collects logs generated in the last 7 days.

11.2.3 Will LTS Stop Collecting Logs If I Disable "Continue to Collect Logs When the Free Quota Is Exceeded" in AOM?

Yes. If you set the log collection to be stopped when the free quota is used up in AOM, the setting is also applied to LTS.

11.2.4 How Do I Disable the Function of Collecting CCE Standard Output Logs to AOM?

Symptom

As the products evolve, the default collection of CCE standard output logs to AOM is no longer recommended, but for compatibility with old user habits, the default configuration is not modified. If the default configuration does not meet your requirements, disable it on the LTS console. You are advised to collect CCE standard output logs to LTS for unified log management.

NOTE

Only when the collection of CCE standard output to AOM is disabled, the CCE standard output configured in LTS will take effect.

Solution

Step 1 Log in to the LTS console and choose **Host Management** in the navigation pane on the left.

Step 2 Choose **Hosts** and click **CCE Cluster**.

Step 3 In the CCE cluster, select the CCE cluster, and disable **Output to AOM**.

Step 4 Click **OK**. After ICAgent is restarted, CCE standard output to AOM is disabled.

----End

11.3 Log Search and Check

11.3.1 How Often Is the Data Loaded in the Real-Time Log View?

Log data is usually loaded every 5 seconds. However, if no data is generated in a 5-second interval, no new data will be displayed. Log data will be updated in the next 5 seconds if there is new data coming in that interval.

11.3.2 What Can I Do If I Cannot View Raw Logs on the LTS Console?

Symptom

No log events are displayed on the **Raw Logs** tab in a log stream on the LTS console.

Possible Causes

- ICAgent has not been installed.
- The collection path is incorrectly configured.
- The **Log Collection** function on the LTS console is disabled.
- Log collection was stopped because your account is in arrears.
- The rate of writing logs into log streams or length of single-line logs exceeds what is supported.
- The browser has slowed down because of the amount of log data.

Solution

- Install the ICAgent. For details, see **Installing ICAgent**.
- If the collection path is set to a directory, for example, **/var/logs/**, only **.log**, **.trace**, and **.out** files in the directory are collected. If the collection path is set to name of a file, ensure that the file is a text file.

- Log in to the LTS console, choose **Configuration Center** > **Log Collection**, and enable the **Log Collection** function.
- Use Google Chrome or Firefox to query logs.

11.3.3 Can I Manually Delete Logs?

No. Manual deletion is not supported. However, logs will be automatically deleted when the retention period ends.

11.3.4 Log Search Issues

This topic describes how to troubleshoot common issues that occur when the search syntax is used to query logs.

Common Issues and Troubleshooting Methods

1. During log query, a message is displayed indicating that the query result is inaccurate.
   - Possible cause: There are too many logs in the query time range, and not all logs are displayed.
   - Solution: Click the query button multiple times until you obtain all logs, or shorten the query time range and query again.
2. Too many log results are matched in a query.
   - Possible cause: Only phrase search **#"value"** can ensure the sequence of keywords. For example, if the query statement is **abc def**, logs that contain either **abc** or **def** and logs that contain the phrase **abc def** will be matched.
   - Solution: Use the phrase **#"abc def"** to accurately match logs containing the phrase **abc def**.
3. Expected logs cannot be queried with specific search statements, and no error message is displayed.
   - Possible cause 1: Search delimiters are not supported.
   - Possible cause 2: The ***** or **?** in a search statement will be regarded as a common character and is not used as a wildcard.
   - Solution: Use the correct query statement.

Error Messages and Solutions

1. An error message is displayed during log query, indicating that no field index is configured for the XXX field and the field cannot be queried.

   Solution: Create an index for the *XXX* field in the index configuration and run the query statement again.
2. An error message is displayed during log query, indicating that the full-text index is not enabled and the content field and full-text query are not supported.

   Solution: Enable whole text indexing in the index configuration and run the query statement again.
3. An error message is displayed during log query, indicating that the asterisk (*) or question mark (?) cannot be used at the beginning of a word.

Solution: Modify the query statement or use a correct delimiter to avoid such queries.

4. An error message is displayed during log query, indicating that long and float fields do not support fuzzy query using asterisks (*) or question marks (?).

   Solution: Modify the query statement and use the operator (>=<) or IN syntax for range query.

5. An error message is displayed during log query, indicating that string fields do not support range query using the operator (>=<) or IN syntax.

   Solution

   – Modify the query statement and use the asterisk (*) or question mark (?) to perform fuzzy query.
   – Change the value of this field to a number.

6. An error message is displayed during log query, indicating that the search syntax is incorrect and the query statement need to be modified.

   – Possible cause: The syntax of the operator is incorrect.

     Solution: Each operator has its syntax rule. Modify the search statement. For details, see Search Syntax. For example, the syntax rule for the operator = requires that the value on the right must be digits.

   – Possible cause: The search statement contains syntax keywords.

     Solution: If the log to search contains syntax keywords, the search statement must be enclosed in double quotation marks to convert the keywords into common characters. For example, if **and** is a syntax keyword, change the query statement **field:and** to **field:"and"**.

11.4 Log Transfer

11.4.1 Does LTS Delete Logs That Have Been Transferred to OBS Buckets?

No. During log transfer, logs are "replicated" to OBS buckets. To view transferred log files, click the name of the corresponding OBS bucket on the **Log Transfer** page of the LTS console, and you will be directed to the OBS console to check the files.

11.4.2 What Are the Common Causes of Abnormal Log Transfer?

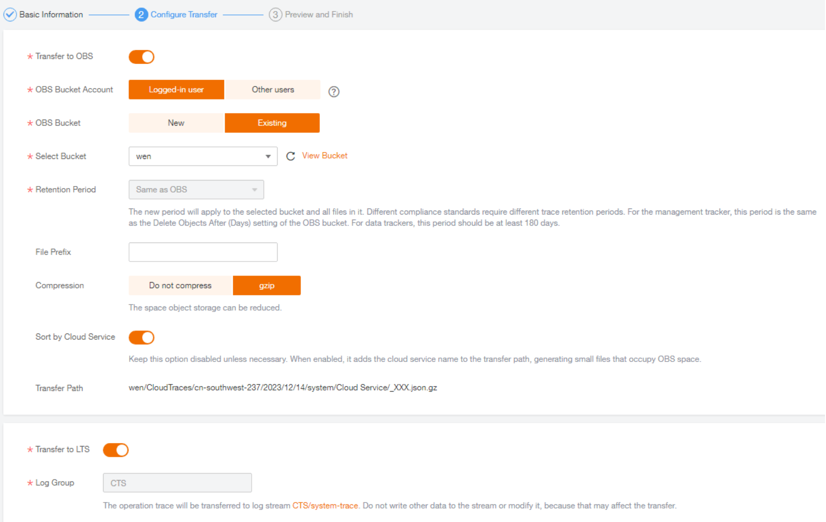
- The OBS bucket used for log transfer has been deleted. Specify another bucket.
- Access control on the OBS bucket is incorrectly configured. Go to the OBS console to correct the settings.

11.4.3 How Do I Transfer CTS Logs to an OBS Bucket?

When Cloud Trace Service (CTS) is connected to LTS, a log group and log stream are automatically created for CTS on the LTS console. To transfer CTS logs to OBS, do as follows:

1. Log in to the CTS console and choose **Tracker List** in the navigation pane on the left.
2. Click **Configure** in the row of the tracker **system**.
3. In the **Basic Information** step, click **Next**.
4. In the **Configure Transfer** step, configure parameters related to transfer logs to OBS, enable **Transfer to LTS**, and click **Next**.

Figure 11-1 Configuring transfer parameters



* Transfer to OBS ●

* OBS Bucket Account: [✓ Logged-in user] Other users

* OBS Bucket: New [✓ Existing]

* Select Bucket: wen

* Retention Period: Same as OBS

The new period will apply to the selected bucket and all files in it. Different compliance standards require different trace retention periods. For the management tracker, this period is the same as the Delete Objects After (Days) setting of the OBS bucket. For data trackers, this period should be at least 180 days.

File Prefix:

Compression: Do not compress [✓ gzip]

The space object storage can be reduced.

Sort by Cloud Service ●

Keep this option disabled unless necessary. When enabled, it adds the cloud service name to the transfer path, generating small files that occupy OBS space.

Transfer Path: wen/CloudTraces/cn-southwest-237/2023/12/14/system/Cloud Service/_XXX.json.gz

* Transfer to LTS ●

* Log Group: CTS

The operation trace will be transferred to log stream CTS/system-trace. Do not write other data to the stream or modify it, because that may affect the transfer.

5. Confirm the configurations and click **Configure**.
6. Access the LTS console, choose **Log Transfer** in the navigation pane on the left, and click **Configure Log Transfer** in the upper right corner.

   Set **Log Group Name** to **CTS** and **Log Stream Name** to **system-trace**. Specify other parameters and click **OK** to transfer CTS logs to the selected OBS bucket.
7. View the transferred CTS logs in the specified OBS bucket on the OBS console.

11.5 Others

11.5.1 How Do I Obtain an AK/SK Pair?

An access key ID and secret access key (AK/SK) constitute an access key.

- AK: access key ID, which is a unique identifier used in conjunction with a secret access key to sign requests cryptographically.
- SK: secret access key used in conjunction with an AK to sign requests cryptographically. It identifies a request sender and prevents the request from being modified.

Obtain and use the AK/SK of a public account.

Procedure

1. Log in to the console, hover the mouse pointer over the username in the upper right corner, and select **My Credentials** from the drop-down list.

2. On the **My Credentials** page, choose **Temporary Access Key**.
3. On the page displayed, click **Create** in the **Operation** column to generate an access key.

   NOTE

   Keep the AK/SK pair secure.