

# Elastic MapReduce

## EMR Serverless TCBASE Operation

### Guide

#### Product Documentation



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# Contents

- EMR Serverless TCBASE Operation Guide
  - Introduction to EMR Serverless TCBASE
  - Managing Instances
    - Managing Permissions
    - Creating an Instance
    - Instance Information
    - Modifying an Instance
    - Terminating an Instance
  - Managing Services
    - WebUI Access
    - Application Connection
    - Managing Configurations
      - Updating Configurations
      - Rolling Back Configurations
    - Managing Plugins
  - Monitoring and Alarms
    - Monitoring Instances
    - Instance Events
    - Configuring Alarms

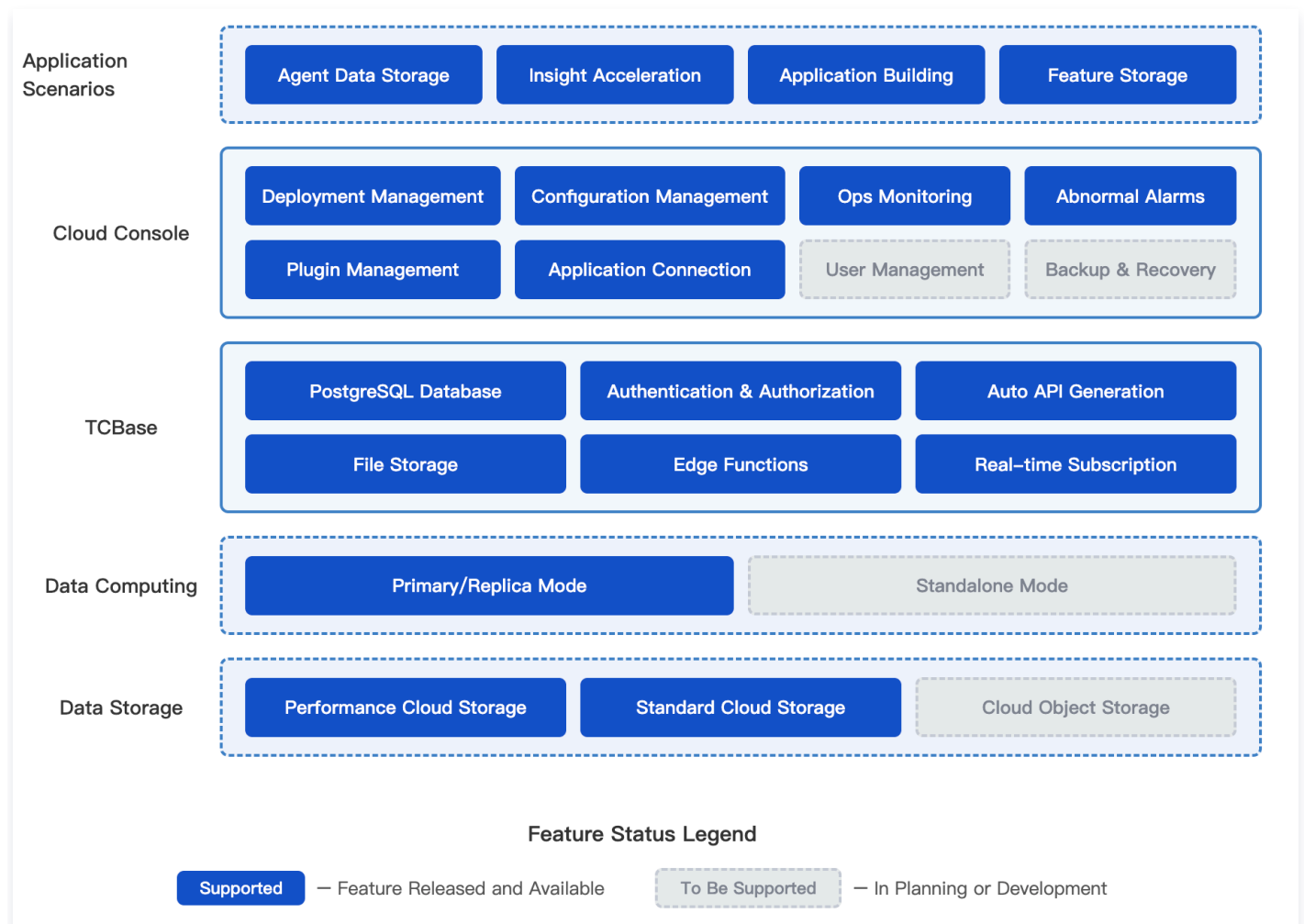
# EMR Serverless TCBASE Operation Guide

## Introduction to EMR Serverless TCBASE

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EMR Serverless TCBASE is a fully managed, lightweight data service platform that integrates a cloud-native database kernel with high-performance analytical capabilities. This product aims to provide users with an integrated experience from data storage and real-time processing to application building. It not only supports diverse data storage and access for AI model training and inference, but also enables hybrid OLTP and OLAP analysis. Additionally, it delivers exceptional single-instance analytical performance in a lightweight, low-barrier manner.

### Product Architecture



#### Note:

- Data storage: EMR Serverless TCBASE supports both integrated and decoupled storage-compute scenarios, offering various storage methods such as cloud storage and Cloud Object

Storage (COS). Users can store data in these data sources, though only cloud storage is supported during the beta period.

- **Data computing:** The instance computing unit architecture supports primary/replica and standalone modes. The primary/replica mode provides primary/replica dual nodes, and only the primary/replica mode is supported during the beta period.
- **TCBase:** Provides visual database management, authentication configuration, storage management, function deployment, API documentation, monitoring logs, and other features.
- **Cloud console:** Provides visual instance Ops features such as management, configuration, and monitoring/alarming for EMR Serverless TCBase instances.
- **Application scenarios:** EMR Serverless TCBase is suitable for scenarios such as the efficient construction of lightweight AI applications (Agents) and real-time analysis of HTAP hybrid workloads.

## Advantages

- **Out-of-the-box application development platform:** Fully compatible with open-source Supabase capabilities, providing auto-generated APIs, file storage, real-time subscriptions, user authentication, and edge functions. This enables developers to rapidly release applications without building a backend, significantly improving development efficiency.
- **HTAP (Hybrid Transactional/Analytical Processing) integration and high-performance analytics:** Unified support for transactional processing and complex analytics. By embedding a DuckDB high-performance engine, it achieves lightning-fast OLAP queries on massive data at the single-machine level without data migration.
- **Native AI application support:** Built-in vector database extensions support data demands in the AI era. Deeply integrated with Tencent Cloud AI development tools, it supports database design and application development via natural language interaction, making it an ideal foundation for building AI Agents and intelligent applications.
- **Enterprise-grade fully managed service:** Provides high availability, second-level elastic scaling, multiple payment modes, and security compliance guarantees. This eliminates the high Ops costs and technical risks of self-built open-source solutions, thus delivering reliable, low-cost data services.

# Managing Instances

## Managing Permissions

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This document describes how to grant permissions to service roles, collaborators/sub-users, and customize permission policies when Elastic MapReduce (EMR) Serverless TCBASE is used.

### Granting Permissions to the Service Role

When using EMR Serverless TCBASE for the first time, you need to grant the service role EMR\_QCSRole to the EMR product, enabling it to call product features and use necessary permissions for related products.

1. Log in to the [EMR Serverless TCBASE console](#). On your first visit, a prompt will appear asking you to authorize EMR. Click **Grant Authorization** to go to the Role Management Authorization page.
2. After confirming the service authorization information, click **Authorize** to complete the service role authorization.

#### Note:

When a sub-user or collaborator account is used for the first time, please ensure that the account has been granted the QcloudCamSubaccountsAuthorizeRoleFullAccess permission.

### Granting Permissions to Collaborators/Sub-users

In practice, the accounts that actually use products are mainly collaborators or sub-users. Depending on authorization requirements, you can grant sub-users or collaborators different granularities of operation permissions.

The authorization settings for sub-users and collaborators are consistent with the EMR on CVM version. For details, see [Collaborator/Sub-user Authorization](#).

### Custom Policy Operation Guide

The settings for custom policy operations are consistent with the EMR on CVM version. For details, see [the operation guide for custom policies](#).

# Creating an Instance

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## Scenarios

This document describes the operation steps and relevant configurations for creating an Elastic MapReduce (EMR) Serverless TCBASE instance via the EMR console.

## Preparations

1. The service role EMR\_QCSRole has been authorized for the EMR service.
2. The user has the necessary permissions to create instances.

## Operation Steps

Log in to the [EMR Serverless TCBASE console](#), click Create Instance on the instance list page, and complete the relevant configurations on the purchase page. When the instance status in the list shows Running, it indicates the instance has been successfully created.

Configuration Item	Description
Region	The physical data center where the instance is deployed. Each region is an independent data center, and the private networks of cloud services are not interconnected across different regions. <b>Note: The region cannot be changed after the instance is created. Please choose carefully. For supported regions available for purchase, see <a href="#">Billing Overview</a>.</b>
Instance Name	Set an instance name to distinguish between instances for different purposes.
Billing Mode	Supports pay-as-you-go and yearly/monthly subscription billing modes.
Instance Network	Select a virtual private cloud (VPC) in the corresponding region. If none exists, click <b>Create VPC</b> to create one.
Availability Zone and Subnet	Select the availability zone and subnet for instance deployment. <b>Note: The availability zone cannot be changed after the instance is created. Please choose carefully.</b>
Public Network Access Settings	Used for accessing the TCBASE WebUI via the public network and supports public network LB access.

Security Group	Security groups feature firewall capabilities to configure network access controls for Cloud Virtual Machines (CVMs). If the number of security groups has reached the upper limit and new ones cannot be created, you can delete unused security groups.
Computing Unit Architecture	Select the computing unit architecture. The default is primary/replica mode.
Instance Specifications	Select the appropriate instance specifications.
Storage Type	Select the storage type. Standard cloud storage and performance cloud storage are supported.
Storage Space	The storage space per node is 100 GB by default and can be adjusted in multiples of 100 GB.
User Information	Set the username and password for TCBASE WebUI and database login. You can modify the password in the console after the instance is created.
Tag	Tencent Cloud tags can be used to distinguish between different instance uses or for cost allocation by tag.
Purchase Duration	Select the duration for purchasing a monthly subscription instance.
Auto-Renewal	Optional. The system will check daily whether the available balance in the user account is sufficient 7 days before the cluster expires and renew the cluster resources with automatic renewal enabled. For yearly/monthly subscription clusters, automatic renewal is selected by default, and users can manually deselect it.

# Instance Information

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## Scenarios

View configuration information such as instance specifications, network, and tag, as well as status information.

## Operation Steps

1. Log in to the [EMR Serverless TCBASE console](#), find the instance you need to view from the instance list, and click the **instance ID** to go to the **Instance Information** page.
2. In the **Basic Information** section, you can view the billing, tag, and other information of the instance.
3. In the **Deployment Information** section, you can view the storage and computing specifications information of the instance.
4. In the **Access Information** section, you can view the TCBASE access address of the instance.

# Modifying an Instance

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## Scenarios

After creating an Elastic MapReduce (EMR) Serverless TCBASE instance, you can perform operations such as modifying instance configurations, scaling out storage, modifying tags, and changing the instance display name.

## Operation Steps

### Modifying Instance Configurations

#### Note:

- The instance will be shut down during the configuration change process, which may affect normal instance usage or even cause business interruption. Please evaluate carefully before proceeding.
- The instance will restart by default after the configuration change. Please perform this operation during off-peak business hours.

### Prerequisites

1. After configuration adjustments, pay-as-you-go nodes will have their fees re-frozen based on the latest unit prices. For yearly/monthly subscription clusters, the corresponding fee difference must be covered. Please ensure that your account balance is sufficient.
2. The refund amount will be returned to your Tencent Cloud account in proportion to the cash and gift credits used at the time of purchase. Discounts or vouchers used during the purchase will not be refunded.

### Operation Steps

1. Log in to the [EMR Serverless TCBASE console](#), find the instance that needs to be modified from the instance list, and click the **instance ID** to go to the instance information page.
2. In the **Instance Information > Deployment Information** module, click **Change Configuration**.
3. On the Adjust Configuration page, confirm the relevant configuration adjustments, select the target instance specifications, carefully read the important notes, and check the box to agree to the changes.
4. Click **Confirm** to apply the changes.

### Scaling Out Storage

1. Log in to the [EMR Serverless TCBASE console](#), find the instance that needs to be modified from the instance list, and click the **instance ID** to go to the instance information page.
2. In the **Instance Information > Deployment Information** module, click **Scale-out Storage**.
3. After the storage scale-out operation panel opens, **adjust the target storage** as needed.
4. Click **Confirm** to apply the changes.

## Modifying Tags

1. Log in to the [EMR Serverless TCBASE console](#), find the instance that needs to be modified from the instance list, and click the **instance ID** to go to the instance information page.
2. In the **Instance Information > Basic Information** module, click **Edit** next to the tag information.
3. After the tag editing operation panel opens, add new tags or remove old tags for the instance as needed.
4. Click **Confirm** to apply the changes.

## Changing the Instance Display Name

1. Log in to the [EMR Serverless TCBASE console](#) and locate the instance that requires modification from the instance list.
2. Move the mouse pointer over the name of the instance to be modified, and click **Edit**.
3. After the instance name modification panel opens, enter the new instance name.
4. Click **Confirm** to save the changes.

# Terminating an Instance

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## Scenarios

When an Elastic MapReduce (EMR) Serverless TCBASE instance is no longer needed due to business changes, you can release resources by terminating the instance.

### Note:

All data within the instance will be cleared after termination. Proceed with caution after confirming the risks.

## Operation Steps

1. Log in to the [EMR Serverless TCBASE console](#), find the instance that needs to be terminated from the instance list, and click **Terminate** in the Operation column.
2. After the termination confirmation panel opens, confirm that the instance can be terminated and click **Confirm** to start terminating the instance.

# Managing Services

## WebUI Access

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### Feature Overview

After the public network is enabled, users can quickly access the TCBASE console via the WebUI portal or external access links.

#### Warning:

Enabling public network access may introduce security risks to the instance, as it allows direct access, manipulation, or even deletion of your Elastic MapReduce (EMR) data via API. Please enable it with caution.

### Prerequisites

1. The TCBASE console can only be accessed via the WebUI address after public network access is enabled.
2. If public network access is disabled, you will be unable to log in to the TCBASE console, but you can still access TCBASE via the private network address in the backend.

### Viewing the WebUI Access Address

1. Log in to the [EMR Serverless TCBASE console](#). Click **View WebUI** in the Operation column of the instance list, or click **Instance ID/Name** of the corresponding instance in the instance list to go to the instance details page. In the **Instance Information > Access Information** module, copy the **public network access address**.
2. Access to the address requires authentication. Please log in using the username and password set during cluster creation. If you need to change the password, go to Configuration Management.

# Application Connection

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## Scenarios

This document describes the operation steps for obtaining the connection information of the TCBASE service via the Elastic MapReduce (EMR) console.

## Operation Steps

1. Log in to the [EMR Serverless TCBASE console](#), select the corresponding instance in the instance list, and click **Instance ID/Name** to go to the instance details page.
2. In the left sidebar of the instance details page, choose **Operation > Application Connection**. In the displayed **Application Connection** dialog box, select the connection information as needed.

# Managing Configurations

## Updating Configurations

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### Feature Overview

Configuration management supports modifying key parameters of TCBASE, allowing service configuration adjustments based on actual needs. This document describes how to configure TCBASE service parameters via the console.

### Operation Steps

#### Editing Configuration Items

1. Log in to the [EMR Serverless TCBASE console](#), select the corresponding instance in the instance list, and click **Instance ID/Name** to go to the instance details page.
2. Go to the configuration management page. If you want to search for a specific configuration item or narrow down the search range of configuration items, you can filter them using the filter on the left.
3. Select the configuration file as needed, click **Edit Configuration** to enter the editing mode, and perform operations such as editing or deleting configuration items as required.
  - Select the parameter to be modified and enter a new value. If needed, click **Restore** to restore to the original value, or click **Default Value** to restore the system-recommended default value.
  - Some parameters support deletion. To delete this configuration, choose **Delete > Confirm**.
4. After confirming the changes, click **Save Configuration**. Once the configurations are distributed and the service is restarted successfully, the modification of configuration items is complete.

#### Importing Configurations in Batches

1. Log in to the [EMR Serverless TCBASE console](#), select the corresponding instance in the instance list, and click **Instance ID/Name** to go to the instance details page.
2. Go to the configuration management page. If you need to modify configuration items in batches, click **Edit Configuration** to enter the editing mode, and select **Import Configuration** to perform batch import. The configuration files supported for import are as follows:
  - Managed configuration files: Only supports importing specific configuration files already managed in the console, specifically including configuration files in .xml, .properties, .conf, .config, .cfg, and .sh formats.
  - Exported configuration: Supports importing JSON-formatted .conf configuration files exported via the Export Configuration feature on the configuration management page.

**Note:**

When a naming conflict occurs between an imported second–category .conf configuration file and an imported first–category .conf configuration file, the system will prioritize parsing according to the format of the first–category configuration file. This may cause parsing issues for the second–category configuration file. Proceed with caution to avoid unnecessary errors.

## Exporting Configurations

1. Log in to the [EMR Serverless TCBASE console](#), select the corresponding instance in the instance list, and click **Instance ID/Name** to go to the instance details page.
2. Go to the configuration management page and click **Export Configuration**.
3. Select the files to be exported and the export scope, and click **Export Configuration** to download the software configuration files to your local machine.
  - 3.1 Export Mode: Defaults to All configurations, and supports selecting to export only customized or modified configurations (choose one).
  - 3.2 Export Format: Only the JSON format is supported.

# Rolling Back Configurations

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Elastic MapReduce (EMR) supports configuration rollback for operations such as modifying and deleting configuration items in the console. This document describes how to roll back service parameter configurations via the console.

## Operation Steps

1. Log in to the [EMR Serverless TCBASE console](#), select the corresponding instance in the instance list, and click **Instance ID/Name** to go to the instance details page.
2. Go to the configuration management page and click **Configuration History**.
3. Click **Details** to view the comparison of parameter values before and after the configuration change. Click **Rollback** to roll back the parameter configuration change for this record. Choose **Rollback > Confirm Rollback**. After the rollback succeeds, restart the service and wait a moment for the rollback to take effect.

# Managing Plugins

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## Scenarios

This document describes how to manage schemas and perform plugin operations for TCBBase via the Elastic MapReduce (EMR) console.

## Operation Steps

### Installing a Plugin

1. Log in to the [EMR Serverless TCBBase console](#), select the corresponding instance in the instance list, and click **Instance ID/Name** to go to the instance details page.
2. Go to the plugin management page, and select the single or batch plugin operation plan as needed:
  - 2.1 Single plugin installation: Select the plugin to be installed, and select **Install** in the Operation column of the list to go to the plugin installation pop-up page.
  - 2.2 Batch installation of multiple plugins: Select the plugins to be installed, and select **Install** in the table header to go to the plugin installation pop-up page.
3. Confirm the information of the plugin to be installed and specify the schema. You can select an existing schema or enter a name to create a new one.
4. After confirming that the information is correct, click **Confirm** to start installing the plugin.

### Uninstalling a Plugin

#### Note:

- If the plugin still has dependent objects, is extended, or is referenced by external objects, the plugin uninstallation will fail.
- If user permissions are insufficient, the plugin uninstallation will fail.
- Plugin uninstallation may cause exceptions in ongoing transactions. Proceed with caution.

1. Log in to the [EMR Serverless TCBBase console](#), select the corresponding instance in the instance list, and click **Instance ID/Name** to go to the instance details page.
2. Go to the plugin management page, and select the single or batch plugin operation plan as needed:
  - 2.1 Single plugin uninstallation: Select the plugin to be uninstalled, and select **Uninstall** in the Operation column of the list to go to the plugin uninstallation pop-up page.
  - 2.2 Batch uninstallation of multiple plugins: Select the plugins to be uninstalled, and select **Uninstall** in the table header to go to the plugin uninstallation pop-up page.

3. Confirm the information of the plugin to be uninstalled. After verification, click **Confirm** to start uninstalling the plugin.

# Monitoring and Alarms

## Monitoring Instances

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### Scenarios

View the operational metrics of TCBASE instances.

### Operation Steps

1. Log in to the [EMR Serverless TCBASE console](#), find the instance you need to view from the instance list, and click **Monitor** to go to the **Monitoring and Alarms** page.
2. After the Monitoring and Alarms page is accessed, you can view the TCBASE operational metrics as needed.

# Instance Events

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## Feature Overview

Instance events include event lists and event policies.

- Event list: Records key change events or abnormal events that occur in instances.
- Event policy: Supports customizing event monitoring trigger policies based on business scenarios.

## Viewing the Event List

1. Log in to the [EMR Serverless TCBASE console](#), find the instance you need to view from the instance list, and click **Monitor** to go to the **Monitoring and Alarms** page.
2. On the Monitoring and Alarms page, select **Instance Events** to directly view all operation events of the current instance.

The descriptions of severity levels are as follows:

- Fatal: Abnormal events of nodes or services that require manual intervention. Otherwise, services become unavailable. Such events may persist for a period of time.
  - Critical: Events that have not yet caused service or node unavailability but are classified as warning-level events. If left unaddressed, they may lead to fatal events.
  - Normal: Records routine events occurring in clusters, which generally require no special handling.
3. Click the value in the **Daily Number of Triggers** column to view event trigger records, as well as associated metrics, logs, or snapshots.

## Configuring Event Policies

1. Log in to the [EMR Serverless TCBASE console](#), find the instance you need to view from the instance list, and click **Monitor** to go to the **Monitoring and Alarms** page.
2. On the Monitoring and Alarms page, select **Event Policy** to customize event monitoring trigger policies.
3. The event configuration list includes: event name, event detection policy, severity (fatal/critical/normal), and monitoring status (enabled), which can be modified and saved.
4. Event detection policies are categorized into two types: one type consists of system-fixed policy events that cannot be modified by users; the other type varies based on customer business standards and supports user configuration.
5. Event policies allow customization of whether to enable event monitoring. Only events with monitoring enabled can be selected as items in cluster inspections. Some events are enabled by default, while others are enabled by default and cannot be disabled. Specific rules are as follows:

Instance	Process killed by OOMKiller	The process was killed by OOMKiller.	CPU, memory, and disk usage. Confirm whether there are memory leaks or resource contention issues. 2. Analyze Java heap memory usage and adjust JVM parameters. 3. Increase the node memory.	-	Critical	Yes	Yes
	Database access unavailable	The PostgreSQL database has failed the liveness probe for n consecutive times.	Usually self-healing; if the issue persists, submit a ticket for consultation.	failure_count=3	Fatal	Yes	Yes
	API Gateway access unavailable	API Gateway (Kong) has failed the liveness probe continuously.	Usually self-healing; if the issue persists, submit a ticket for consultation.	failure_count=3	Fatal	Yes	Yes
	Database HA primary/replica switchover	A primary/replica switchover has occurred in PostgreSQL.	Usually self-healing; if the issue persists, submit a ticket for consultation.	-	Critical	Yes	Yes
	HA cluster having no Leader	There has been no PostgreSQL Leader node continuously within the detection cycle, making the database unwritable.	Usually self-healing; if the issue persists, submit a ticket for consultation.	no_leader_count=2	Fatal	Yes	Yes
	Primary/replica replication delay being too high	The primary/replica replication delay in PostgreSQL has continuously exceeded the threshold, posing a risk to replica database data consistency.	Check the write pressure on the primary database.	lag_threshold_sec=30,sample_count=2	Critical	Yes	Yes
	WAL Receiver stream interruption	The WAL Receiver on the replica database is not in the streaming status, and primary/replica replication is interrupted.	Usually self-healing; if the issue persists, submit a ticket for consultation.	sample_count=2	Critical	Yes	Yes
	Abnormal Patroni node status	The Patroni node status is abnormal, which may affect the PostgreSQL HA feature.	Usually self-healing; if the issue persists, submit a ticket for consultation.	sample_count=2	Critical	Yes	Yes
	etcd unavailable	The etcd cluster has experienced continuous liveness probe anomalies, which may affect the PostgreSQL HA	Usually self-healing; if the issue persists, submit a ticket for consultation.	failure_count=3	Fatal	Yes	Yes

		feature.					
	Number of database connections being too high	The PostgreSQL connection utilization has continuously exceeded the threshold, which may lead to new connections being rejected.	Check for connection leaks and increase max_connections.	usage_pct=80, sample_count=2	Critical	Yes	Yes
	Frequent deadlocks	The increment of PostgreSQL deadlocks within the detection cycle has exceeded the threshold, indicating concurrent transaction conflicts.	Analyze query patterns, check lock sequences, and optimize transaction isolation levels.	deadlock_count=5	Normal	Yes	No
	Cache hit ratio being too low	The PostgreSQL cache hit ratio has been continuously lower than the threshold, leading to heavy disk reads and degraded performance.	Increase shared_buffers, analyze query patterns, and add indexes.	hit_ratio_threshold=90, sample_count=2	Normal	Yes	No
TCBase	Authentication service unavailable	The TCBase authentication service has failed the liveness probe continuously, affecting user authentication, registration, and JWT issuance features.	Usually self-healing; if the issue persists, submit a ticket for consultation.	failure_count=3	Critical	Yes	Yes
	REST API service unavailable	The PostgREST component has failed the liveness probe continuously, and REST API-related requests may be affected.	Usually self-healing; if the issue persists, submit a ticket for consultation.	failure_count=3	Critical	Yes	Yes
	Realtime service unavailable	The Realtime service has failed the liveness probe continuously, and WebSocket subscriptions and real-time push notifications may be affected.	Usually self-healing; if the issue persists, submit a ticket for consultation.	failure_count=3	Critical	Yes	Yes
	Storage service unavailable	The Storage service has failed the liveness probe continuously, and file upload, file download, and S3 protocol may be affected.	Usually self-healing; if the issue persists, submit a ticket for consultation.	failure_count=3	Critical	Yes	Yes
		A certain TCBASE	Usually self-healing; if				

Abnormal component running status	component has failed the liveness probe continuously.	the issue persists, submit a ticket for consultation.	failure_count=3	Normal	Yes	Yes
Database ping latency being too high	The database ping latency has continuously exceeded the threshold, potentially due to I/O bottlenecks or high load.	Check whether the database request pressure is too high.	latency_threshold=100ms,sample_count=2	Normal	Yes	No
Database capacity alert	The machine disk usage has exceeded the threshold. Storage capacity requires attention.	Delete unnecessary data.	size_threshold=10737418240 (10GB)	Normal	Yes	No
HAProxy unavailable	The HAProxy proxy has failed the liveness probe continuously, and database access via HAProxy may be affected.	Usually self-healing; if the issue persists, submit a ticket for consultation.	failure_count=3	Fatal	Yes	Yes
Studio management panel unavailable	The Studio management panel has failed the liveness probe continuously, and the web management interface may be affected.	Usually self-healing; if the issue persists, submit a ticket for consultation.	failure_count=3	Normal	Yes	Yes

# Configuring Alarms

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For Elastic MapReduce (EMR) Serverless TCBASE monitoring and alarm configurations, see [EMR on CVM Alarm Configurations](#). For alarm history, see [Alarm History](#).