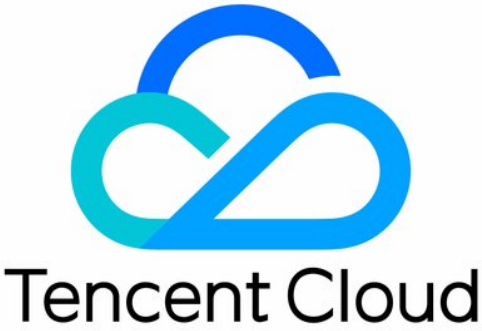
Tencent Cloud Elastic Microservice

Operation Guide

Product Documentation



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Operation Guide
Environment Management
Creating Environment

Last updated：2024-01-26 16:35:41

Overview

In TEM, an environment is a collection of computing, network, storage, and other resources. TEM provides the multi-environment management feature. In this way, you can create multiple environments for development, testing, prerelease, and production according to your business needs, deploy applications separately, and thus implement environment isolation. Applications in different environments are isolated from each other. Applications in the same environment can access each other through the K8s service mechanism or registries such as ZooKeeper and Eureka. This document describes how to create an environment in the TEM console.

Directions

1. Log in to the TEM console.
2. On the **Environment** page, select a deployment region and click **Create**.
3. Configure the environment information.

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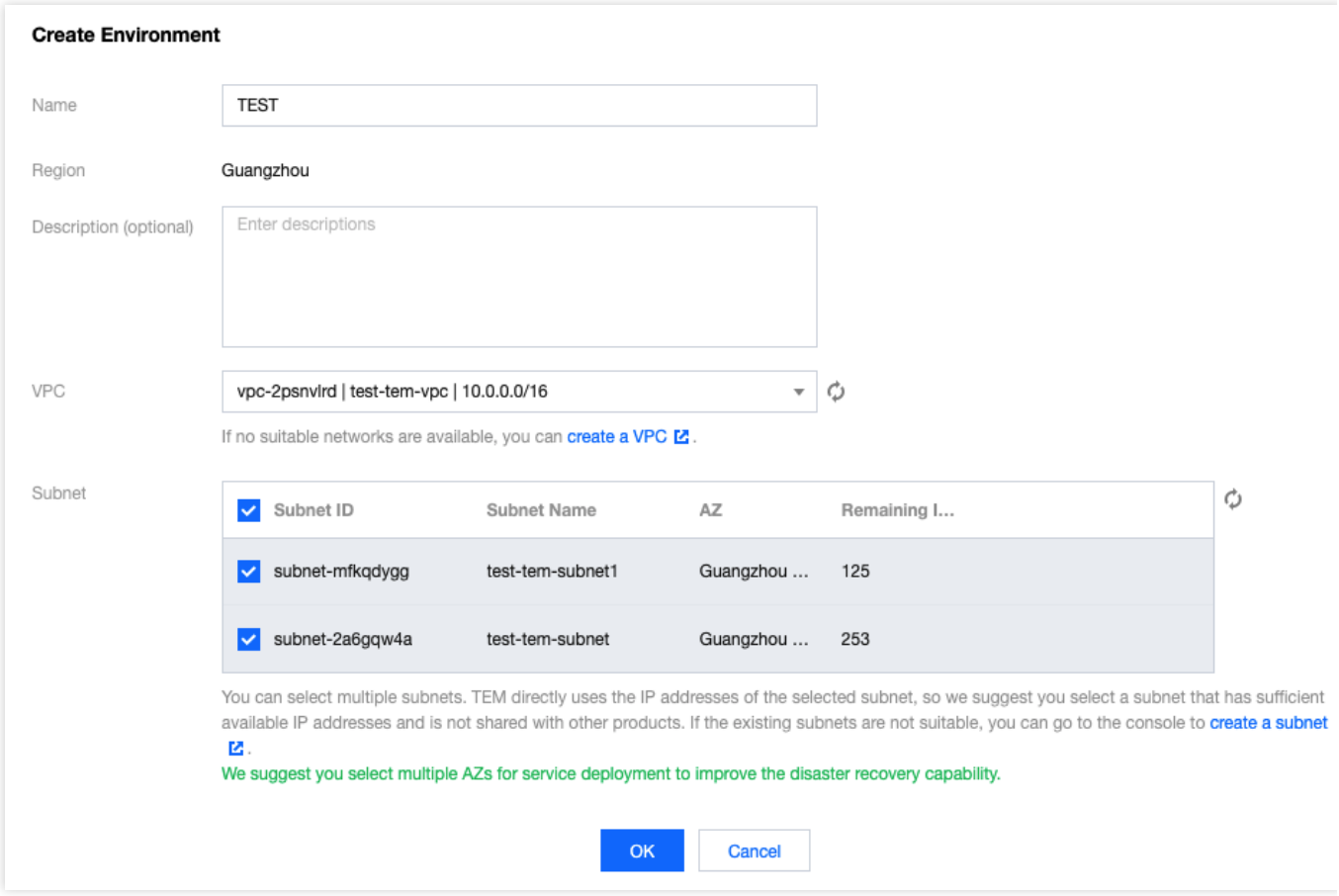

Name: enter up to 40 characters.

VPC: select an existing VPC. If your existing VPCs are not suitable or you haven't created a VPC yet, you can click Create VPC to create one (note that the selected region must be the same as that of the environment), return to and refresh this page, and select it.

Subnet: select an existing subnet. We recommend you choose multi-AZ deployment to improve the disaster recovery capabilities. If your existing subnets are not suitable or you haven't created a subnet yet, you can click Create Subnet to create one, return to and refresh this page, and select it.

CoreDNS is automatically deployed to support service discovery in the environment. Specifically, two replica nodes of `Deployment:coredns` are automatically deployed in the Kubernetes cluster namespace `kube-system`. This service is free of charge, and we recommend you not modify it.

4. Click **OK** and the environment will enter the initialization state. Wait a few minutes, and the environment will be created.

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Adding Environment Resources

Last updated：2024-01-09 12:40:53

Overview

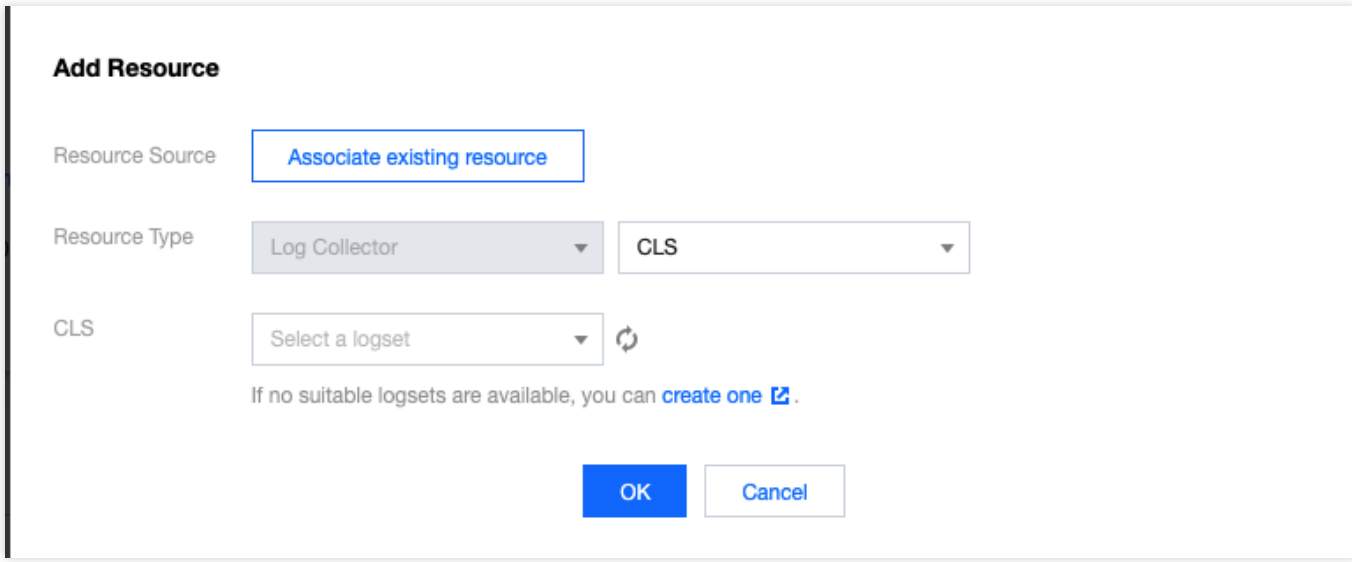
This document describes how to add environment resources in the TEM console.

Directions

1. Log in to the TEM console.
2. On the **Environment** page, select a deployment region and click **View Details** under the target environment block to go to the environment details page.
3. Click the **Resource Management** tab and click **Add** to add storage, log, or registry resources.

Storage: select an existing storage resource. If there are no suitable CFS file systems, you can create one.

Log: select an existing log resource. If there are no suitable logsets, you can create one.



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Configuring Application Access and Routing

Last updated：2024-01-09 12:40:53

Overview

This document describes how to configure application access and routing in the TEM console. You can configure forwarding rules to implement HTTP/HTTPS forwarding rules over the public network. The use cases of this feature include:
Scenarios with applications that require public network access entries, such as microservice gateway applications.
Scenarios where domain name association is needed.
Scenarios where the same domain name has different routing/forwarding paths.
Scenarios where different domain names need to point to the same application.

Directions

1. Log in to the TEM console.
2. On the **Environment** page, select a deployment region and click **View Details** under the target environment block to go to the environment details page.
3. Click the **Access Management** tab on the top, click **Create**, and enter the forwarding rule name.

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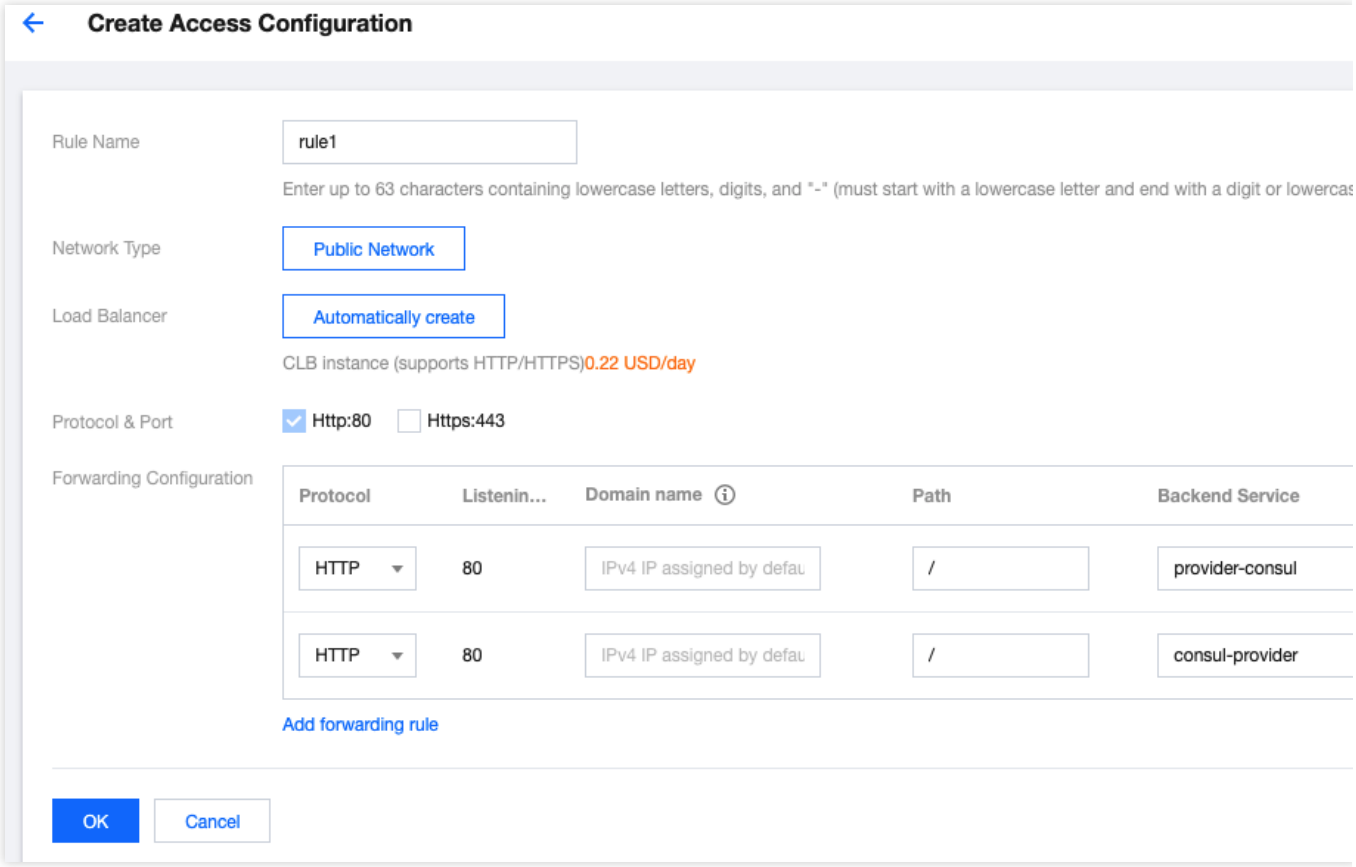

Network Type: check **Public Network**. To configure an intra-environment access, please see Creating and Deploying Application.

Load Balancer: check **Automatically create**.

Protocol and Port: HTTP:80 and HTTPS:443 are supported, and HTTPS domain names can be bound to certificates.

Forwarding Configuration:

Domain Name: existing domain names can be bound. If there are no domain names, you will be assigned an IPv4 IP by default.

Path: the default value is "/". You can configure according to the actual situation.

Backend Service: select according to the actual situation.

Service Port: select according to the actual situation.

Server Certificate: if the HTTP protocol is selected, you need to select a server certificate. If the existing certificates are not suitable, you can create one.

4. Click **OK** to complete the application access and routing configuration.

Related Operations

Modifying an access configuration rule: click **Edit** in the **Operation** column of the target rule and modify the access configuration in the pop-up window.

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Deleting an access configuration rule: click **Delete** in the **Operation** column of the target rule and click **OK** in the pop-up window.
Viewing the details of a forwarding rule: click **View Forwarding Rule** in the **Operation** column of the target rule and view the details in the pop-up window.

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Terminating Environment

Last updated：2024-01-09 12:40:53

Overview

This document describes how to terminate an environment in the TEM console.

Directions

Note:

If there are running application instances in an environment, they need to be terminated first before the environment can be terminated.

1. Log in to the TEM console.
2. On the **Environment** page, select a deployment region and click **Terminate** under the target environment block.
3. Click **Terminate** in the pop-up window to terminate the environment.

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Creating and Using Configurations

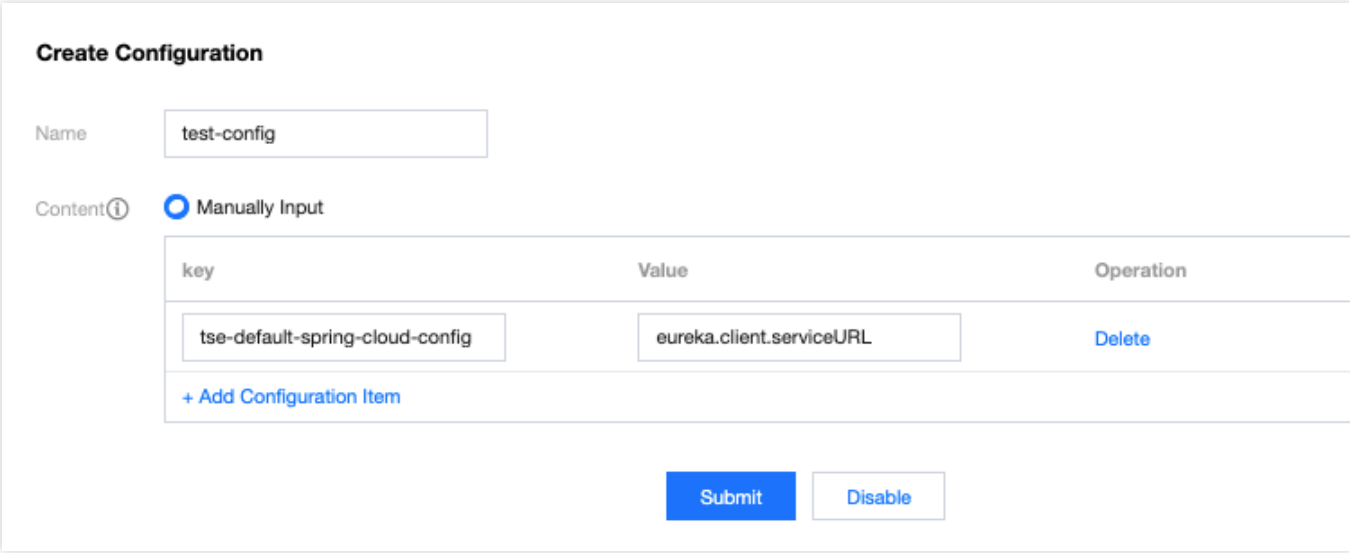
Last updated：2024-01-09 12:40:53

Overview

This document describes how to create and use configurations in the TEM console.

Directions

1. Log in to the TEM console.
2. On the **Environment** page, select a deployment region and click **View Details** under the target environment block to go to the environment details page.
3. Select the **Configuration Management** tab at the top of the page, click **Create**, and enter configuration details.



Name: enter the name of the configuration file.

Content: enter the configured key-value pairs.

4. Click **Submit** to complete the creation.

Related Operations

Modifying a configuration item: click **Edit** in the **Operation** column of the target configuration item and modify the configuration in the pop-up window.

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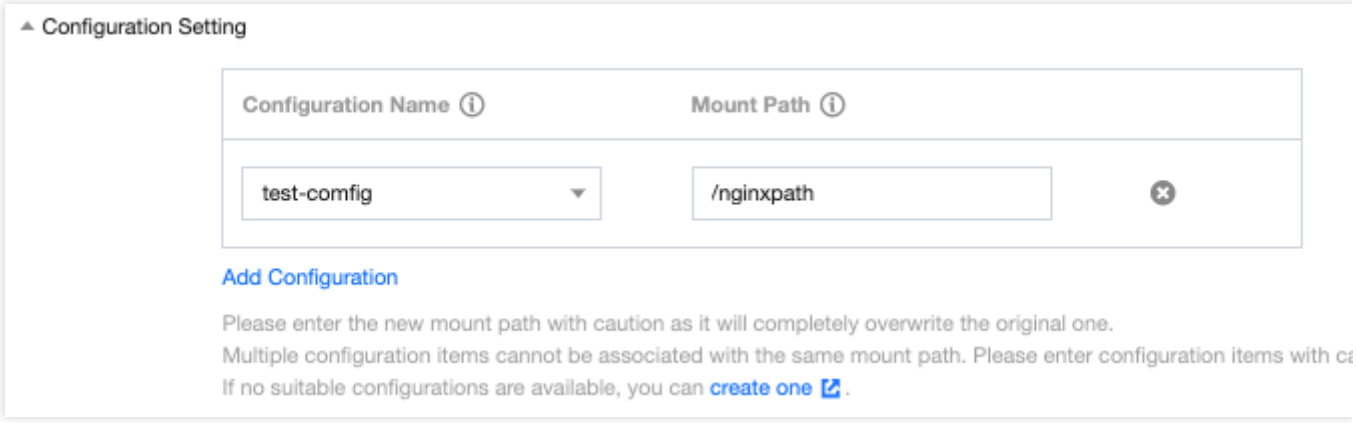
Deleting a configuration item: click **Delete** in the **Operation** column of the target configuration item and click **OK** in the pop-up window.

Note:

Before deleting a configuration that is associated with an application, you need to disassociate it from the application first.

Associating a configuration with an application: go to the **Deploy Application** page, set the path to the container to which the configuration item is mounted in the **Configuration Setting** area. For operation details, please see Creating and Deploying Application.



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Application Management
Creating and Deploying Application

Last updated：2024-01-09 12:40:53

Overview

This document describes how to create an application and deploy it in the TEM console.

Prerequisites

1. You have already created an environment.
2. You have added environment resources (choose log service, storage service, or registry as needed).

Directions

1. Log in to the TEM console.
2. In the left sidebar, click **Application Management** to go to the application list page and select a deployment region for your application.

Region	AZs Supported for Deployment
Guangzhou	Zones 3, 4, and 6
Shanghai	Zones 2, 3, 4, and 5

3. Click **Create** to access the **New application** page and enter the application information.

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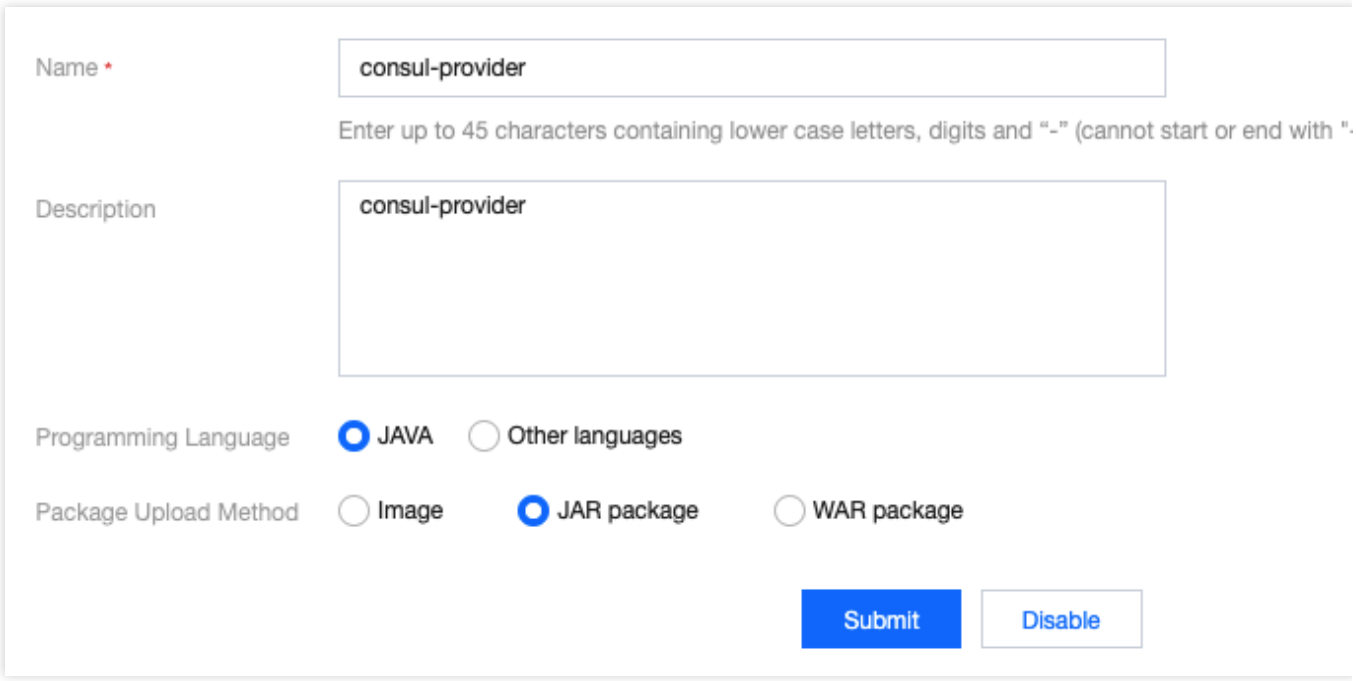
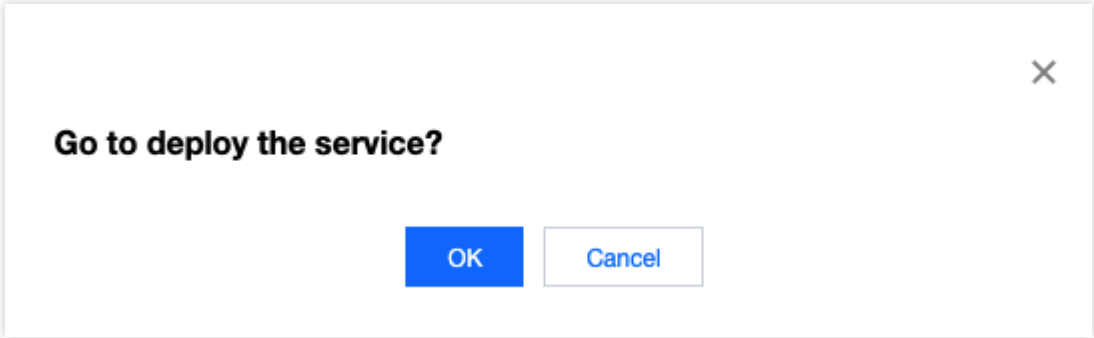


Name: enter the application name, which can contain up to 45 lowercase letters, digits, and hyphens and cannot start or end with a hyphen.

Programming Language: select your programming language.

Package Upload Method: select a package upload method. The Java language supports uploading images, JAR packages, and WAR packages, while other languages only support uploading images. If you select **JAR package** or **WAR package**, TEM will automatically build a container image for you and push it to your personal container image repository created by TEM.

4. Click **Submit** and select **OK** in the pop-up window to enter the application deployment page. If you select **Cancel**, you can click **Deploy to New Environment** in the application list to complete the application deployment later.



5. On the application deployment page, configure the relevant parameters according to the specific conditions of your application.

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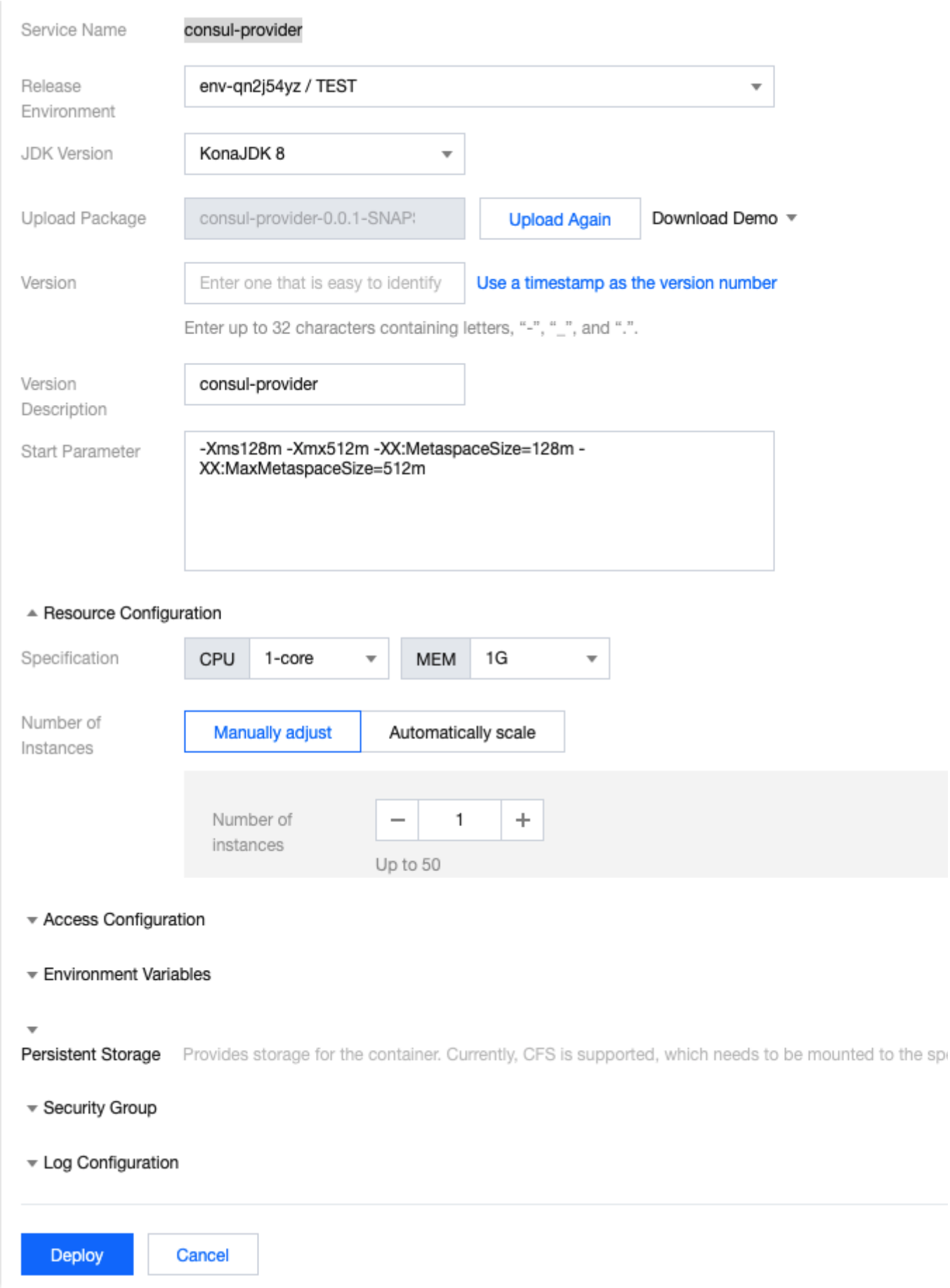

The parameters are described as follows:

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Parameter	Description
Release Environment	Select the environment where the application is located. If there are no suitable environments, you can create one on the Environment page as instructed in Creating Environment.
JDK Version	Select the JDK version, which can be KonaJDK 11（recommend）,OpenJDK 11,KonaJDK 8 or OpenJDK 8.
Upload Package/Image	Upload your package or image or download the demos in the console to deploy them and try out all the features of TEM.
Version Number	Set the application version number. You can choose to enter the version number or click **Use Timestamp as Version Number** to use the timestamp as the application version number.
Version Description	Enter the version description.
Start Parameter	Set the start parameter.

Note:

If your application is in Java and associated with a registry, TEM will be able to automatically inject the registry information. For more information, please see Service Registration and Discovery.

6. (Optional) You can set the following advanced options as needed:

Parameter	Required	Description
Resource Configuration	Yes	You can set a number manually or set an auto scaling rule to automatically scale.
Access Configuration	No	Access Method: access within the environment. The public network access can be configured globally in Environment. For more information, please see Configuring Application Access and Routing. Protocol: TCP and UDP protocols are supported. When public network/private network CLB instances are used, TCP and UDP protocols cannot be used together.
Application Management	No	Configure processing tasks to be executed before and after the application process, for example, environment preparation and application exit.
Configuration Setting	No	Configuration usage and management.
Environment Variables	No	Configure environment variables.

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Health Check	No	Liveness check: check whether an application instance is running properly. If not, restart the instance. Readiness check: check whether an application instance is ready. If not, stop forwarding traffic to the instance. For operation details, see Health Check.
Persistent Storage	No	Persistent Storage: provide storage for the container. Currently, CFS is supported, which needs to be mounted to the specified path of the container. Data Volume: add the CFS storage resources associated in Adding Environment Resource. Mount Target: select the target path to mount the data volume added in this step and enter the version description.
Security Group	No	You can configure a security group rule to allow or reject the outbound and inbound traffic of instances in the security group. If you need to open other ports for your business, you can create a security group accordingly.
Log Configuration	No	You can enable **Persistent storage in CLS**. This supports standard output `stdout` and `*` configuration paths such as `/logs/*`, which should be separated by commas. Standard output is used by default.

7. Click **Submit** to complete the application deployment.
8. For microservice applications, the steps to deploy consumer and server applications are similar to steps 3–7.

Application Access

TEM provides two ways of access: intra-environment access and public network access.
Intra-environment access: microservices in the same environment can call each other through the registered service names. Service registration and discovery based on registries such as Consul as well as service discovery based on Kubernetes are supported.
Public network access: click **View Details** under the target environment block and create public network CLB instances and HTTP/HTTPS forwarding rules on the **Access Management** page to access the application.
Taking public network access as an example, the steps are as follows:
1. Create a public network access route as instructed in Configuring Application Access and Routing.
2. You can view the public IP of the application under **Access Management** on the environment details page.

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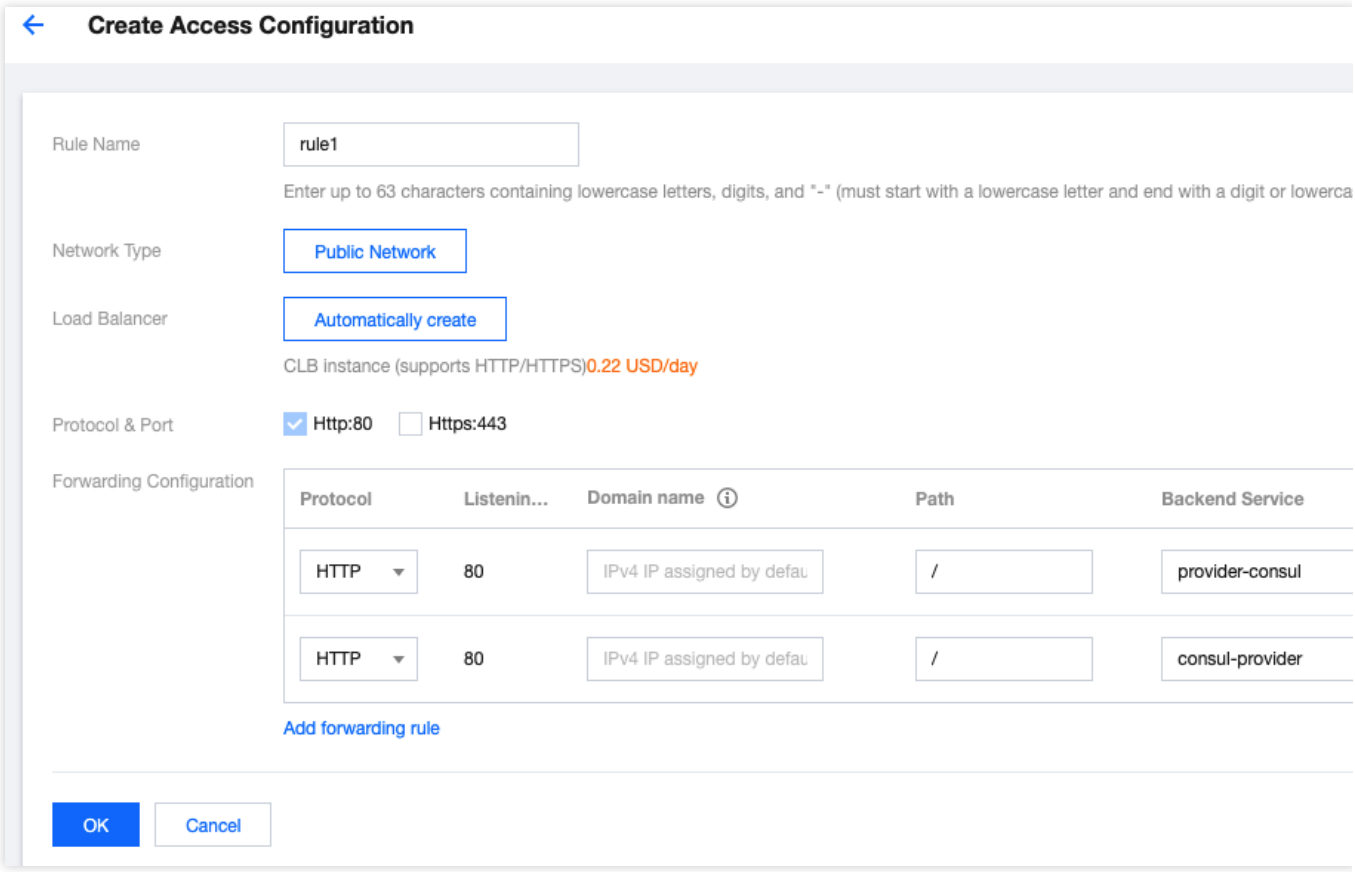

3. Enter the following URL in a browser:

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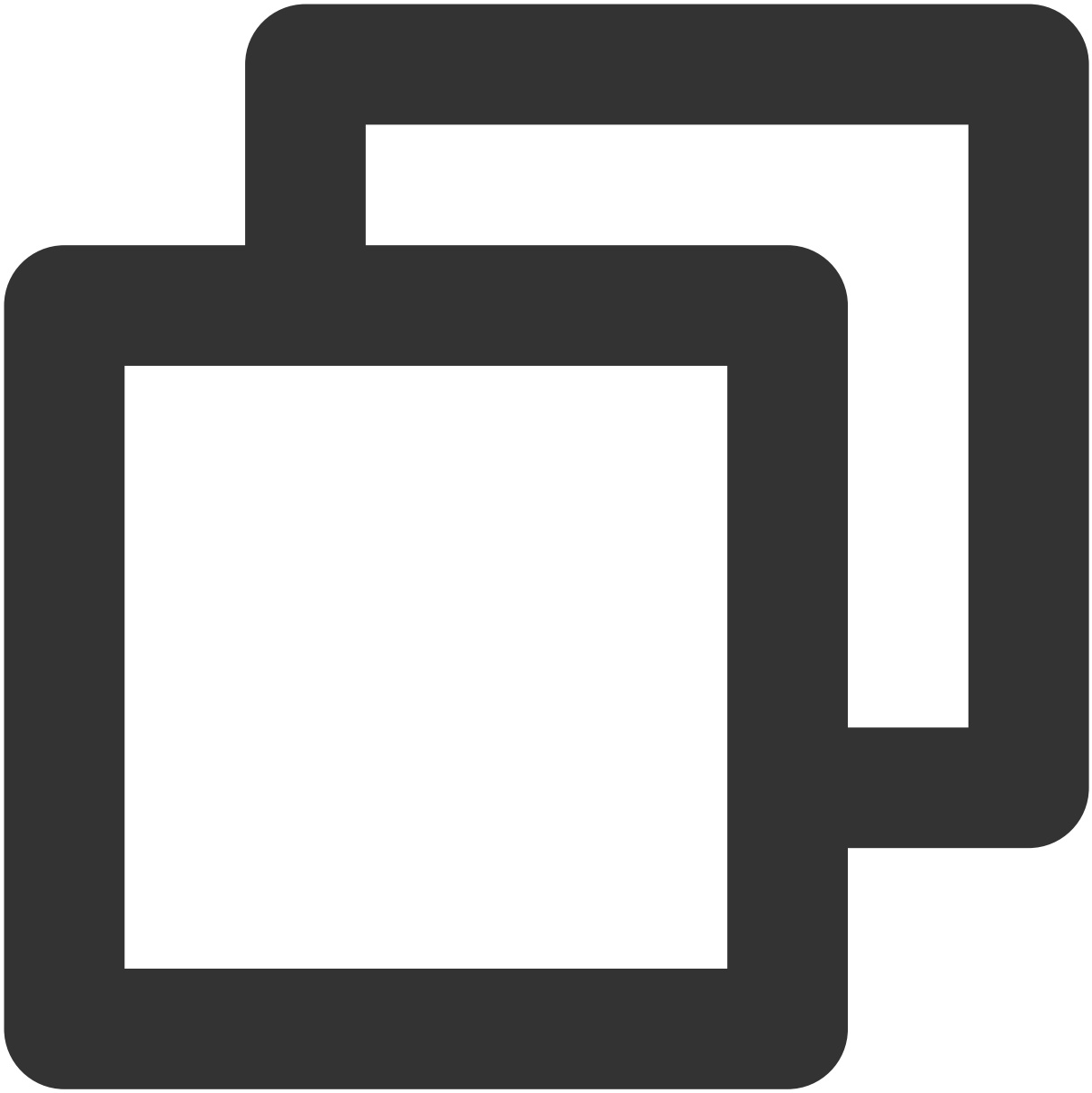

```
<public network access address/domain name>+<path>
```

For example, if the following result is returned after you enter `http://xx.xx.xx.xx/ping-provider`, the application is deployed successfully.

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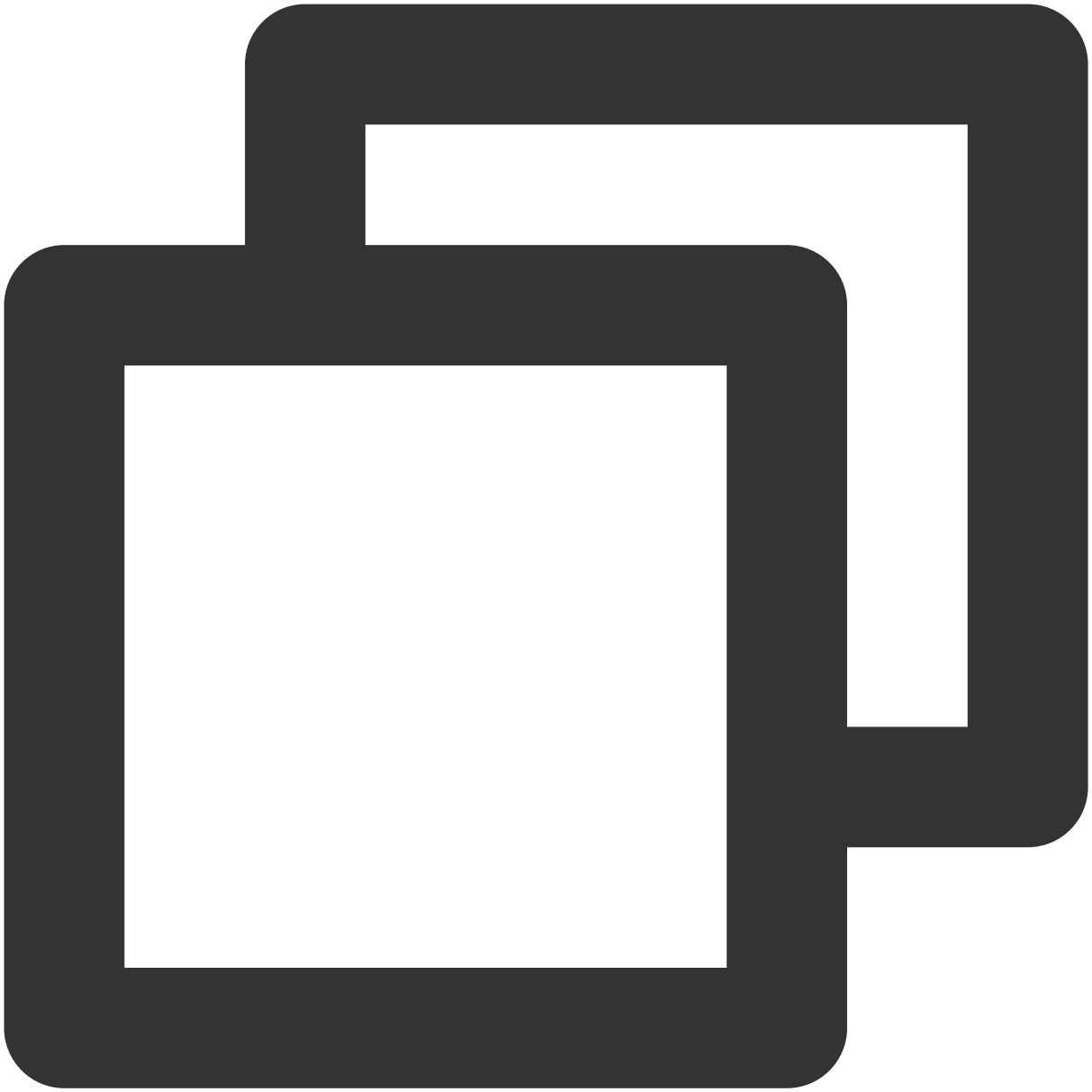

```
Hello World!
```

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Service Registration and Discovery

Last updated：2024-01-09 12:40:53

Overview

This document describes how to register and discover a Spring Cloud application service in the TEM console.

Directions

Operations in console

1. Log in to the TEM console.
2. On the left sidebar, click **Application management** to enter the application management page and select a deployment region for your application.
3. Click **Create** to go to the application creation page and enter the application information for deployment. For more information, see Creating and Deploying Application.
4. For a Spring Cloud application, if a registry is associated with the selected **release environment**, you can select **Auto Inject Registry Info**.

Specific configuration

If you selected **Auto Inject Registry Info**, when you submit the service for deployment, TEM will automatically save the default parameters of the registry as a `.properties` file to the `ConfigMap` named `tse-config` in the environment and mount it to the `/config/tse-default-spring-cloud-config.properties` directory of the application in the form of VolumeMounts.
At the same time, TEM will add the directory to the SPRING_CONFIG_ADDITIONAL-LOCATION environment variable of the application. If the variable does not exist in the application, it will be created.
The basic configuration is as follows:

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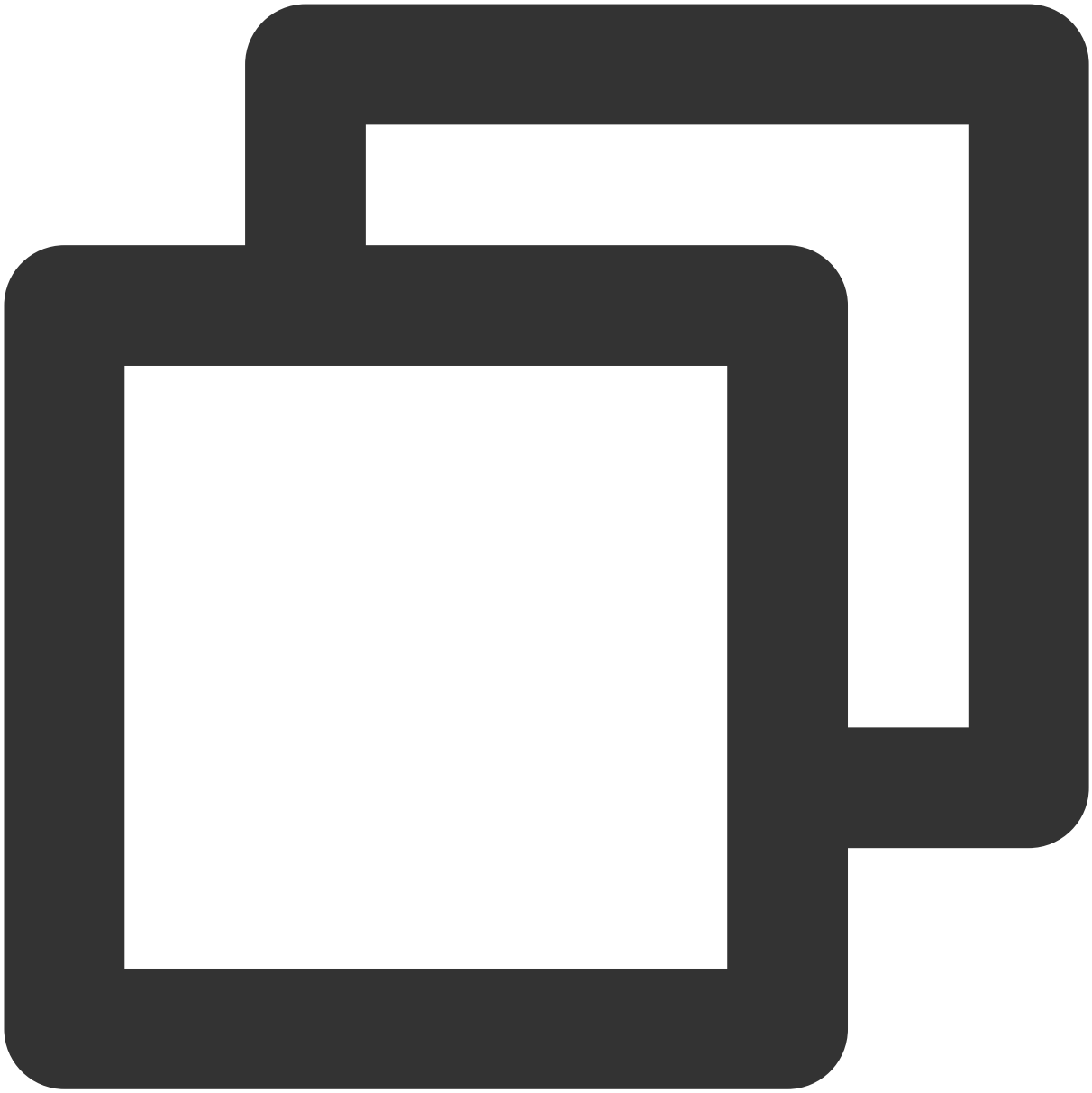

```
apiVersion: v1
kind: Deployment
metadata:
  name: my-service
spec:
  containers:
    - name: my-service
      image: my-image
      env:
        - name: SPRING_CONFIG_ADDITIONAL-LOCATION
          value: file:/config/tse-default-spring-cloud-config.properties
```

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```
      volumeMounts:
        - name: tse-config
          mountPath: /config/tse-default-spring-cloud-config.properties
          subPath: tse-default-spring-cloud-config.properties
  volumes:
    - name: tse-config
      configMap:
        name: tse-config
        items:
          - key: tse-default-spring-cloud-config.properties
            path: tse-default-spring-cloud-config.properties
```

TEM will inject different parameters for different registries:

zookeeper

nacos

Suppose the requested ZooKeeper address is `10.0.1.30:2181` :

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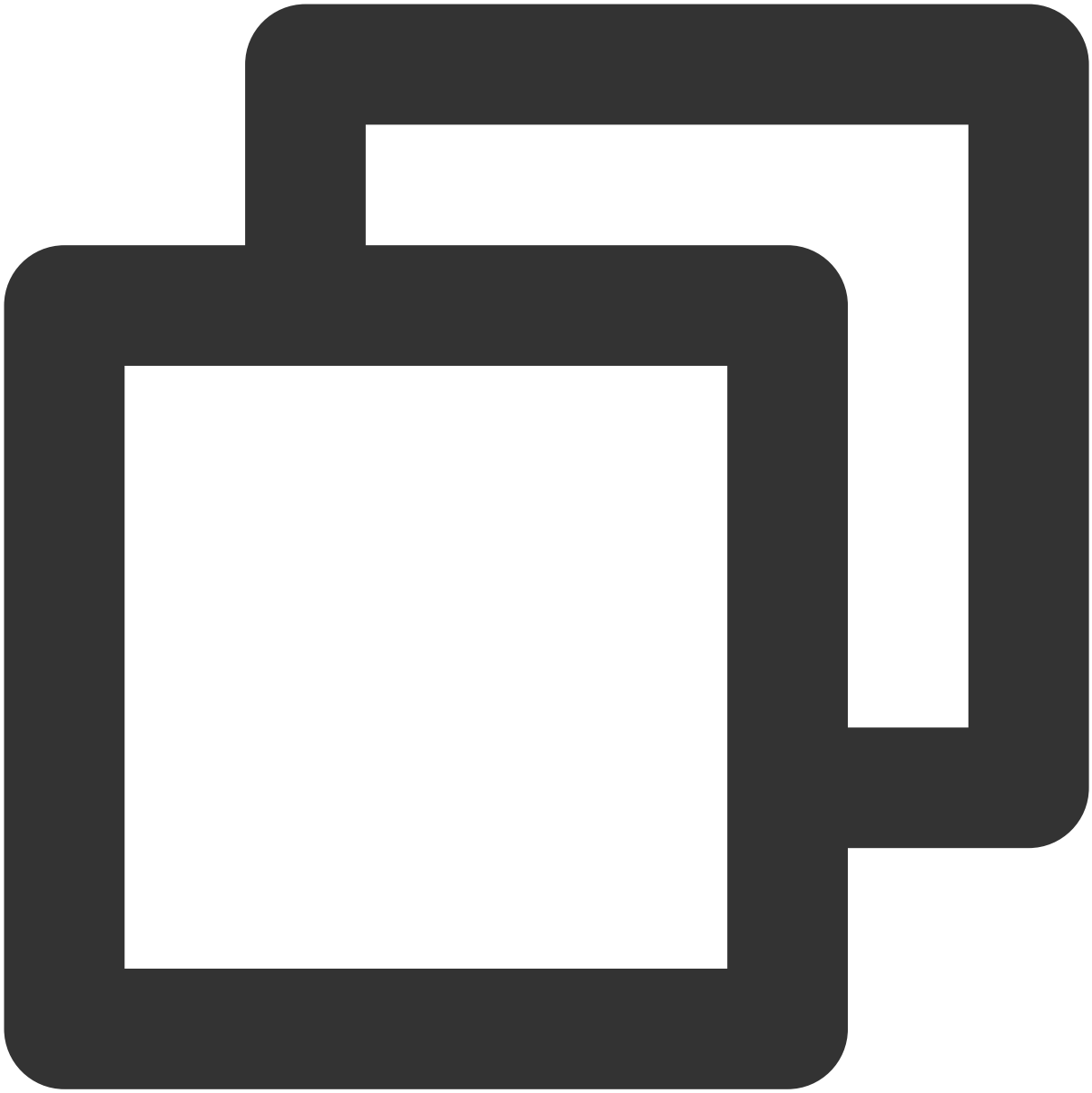

```
apiVersion: v1
data:
  tse-default-spring-cloud-config.properties: |
    spring.cloud.zookeeper.connectString=10.0.1.30:2181
    spring.cloud.zookeeper.discovery.preferIpAddress=true
kind: ConfigMap
metadata:
  name: tse-config
```

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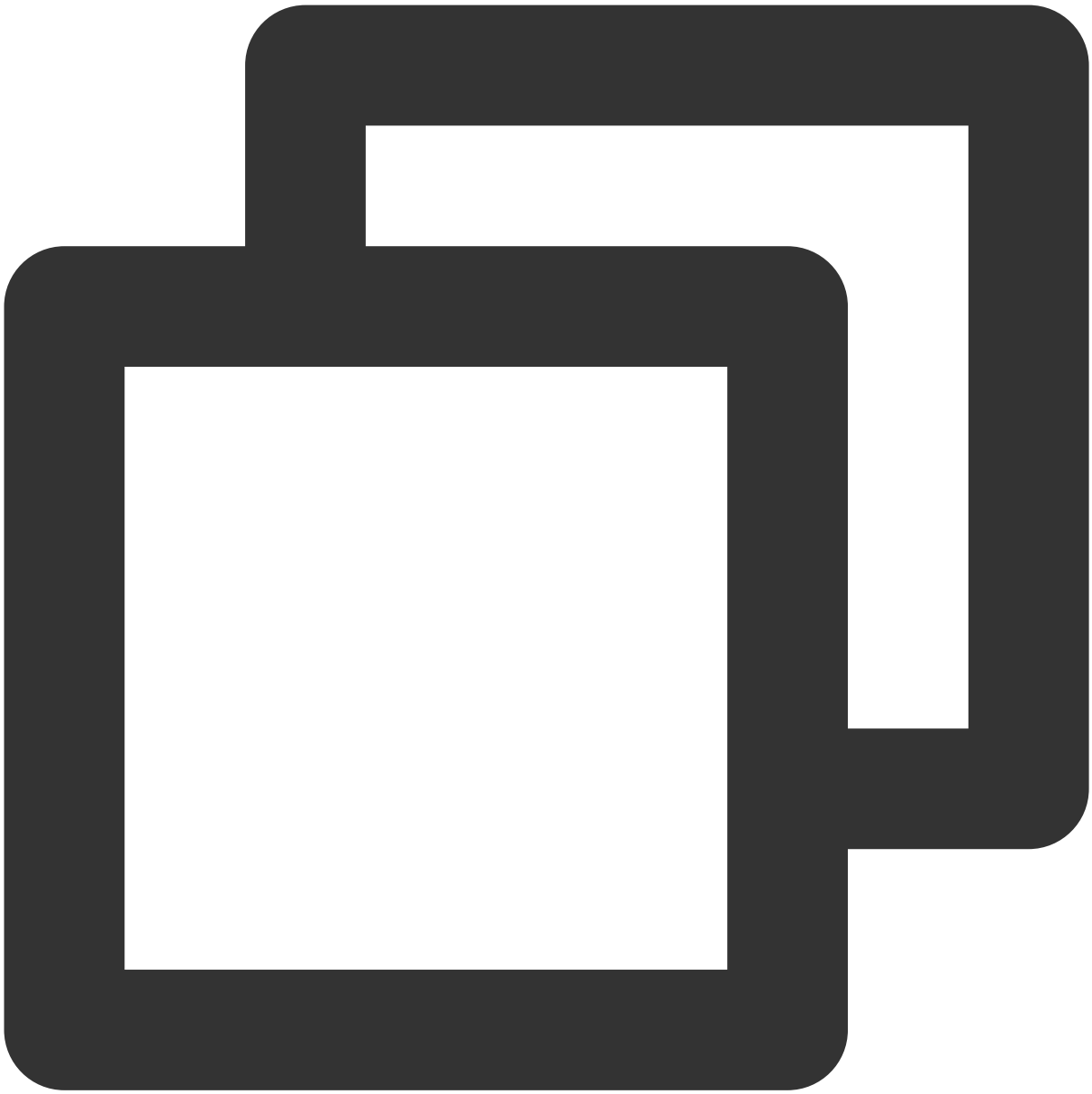
Suppose the requested Nacos address is `10.0.120.11:8848` :



```
apiVersion: v1
data:
  tse-default-spring-cloud-config.properties: |
    spring.cloud.nacos.discovery.server-addr=10.0.120.11:8848
kind: ConfigMap
metadata:
  name: tse-config
```

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Notes and Precautions

Notes on preferIpAddress

`xxx.preferIpAddress=true` is added to all injected registry parameters, as when Spring Cloud gets the local server IP (i.e., Pod IP in TEM), it will automatically query the domain name based on the IP; if `preferIpAddress` is determined to be `false` (default value), the service will be registered through the domain name; otherwise, it will be registered through the IP.

If a `PodName` is mapped by the Pod IP in TEM, that is, if `preferIpAddress=true` is not set, then the address registered with the registry will be a `PodName`, which will be the service instance address pulled by other services from the registry, making the instance inaccessible through the `PodName`.

Notes on Spring Boot additional location

The SPRING_CONFIG_ADDITIONAL-LOCATION environment variable automatically added by TEM enables you to externally customize the configuration of a Spring Boot application, but it takes effect only in Spring Boot v2.0 or later. If you use Spring Boot 1.x, add the mounted directory `/config/tse-default-spring-cloud-config.properties` to the SPRING_CONFIG_LOCATION environment variable on your own.

You can also set this by directly adding the JVM launch parameters as follows:

zookeeper

nacos

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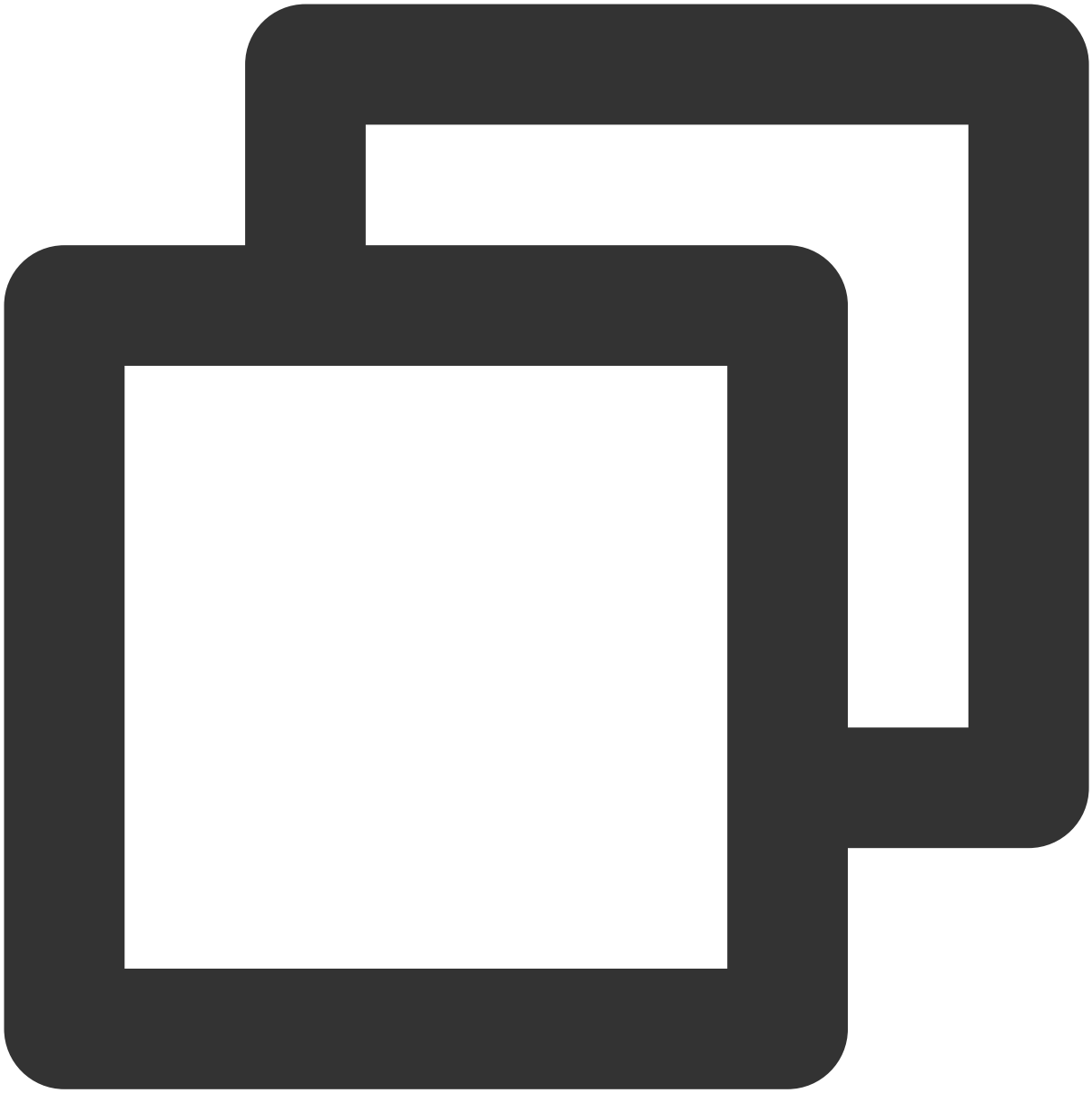

```
# Suppose the requested ZooKeeper address is `10.0.1.30:2181`
-Dspring.cloud.zookeeper.connectString=10.0.1.30:2181
-Dspring.cloud.zookeeper.discovery.preferIpAddress=true
```

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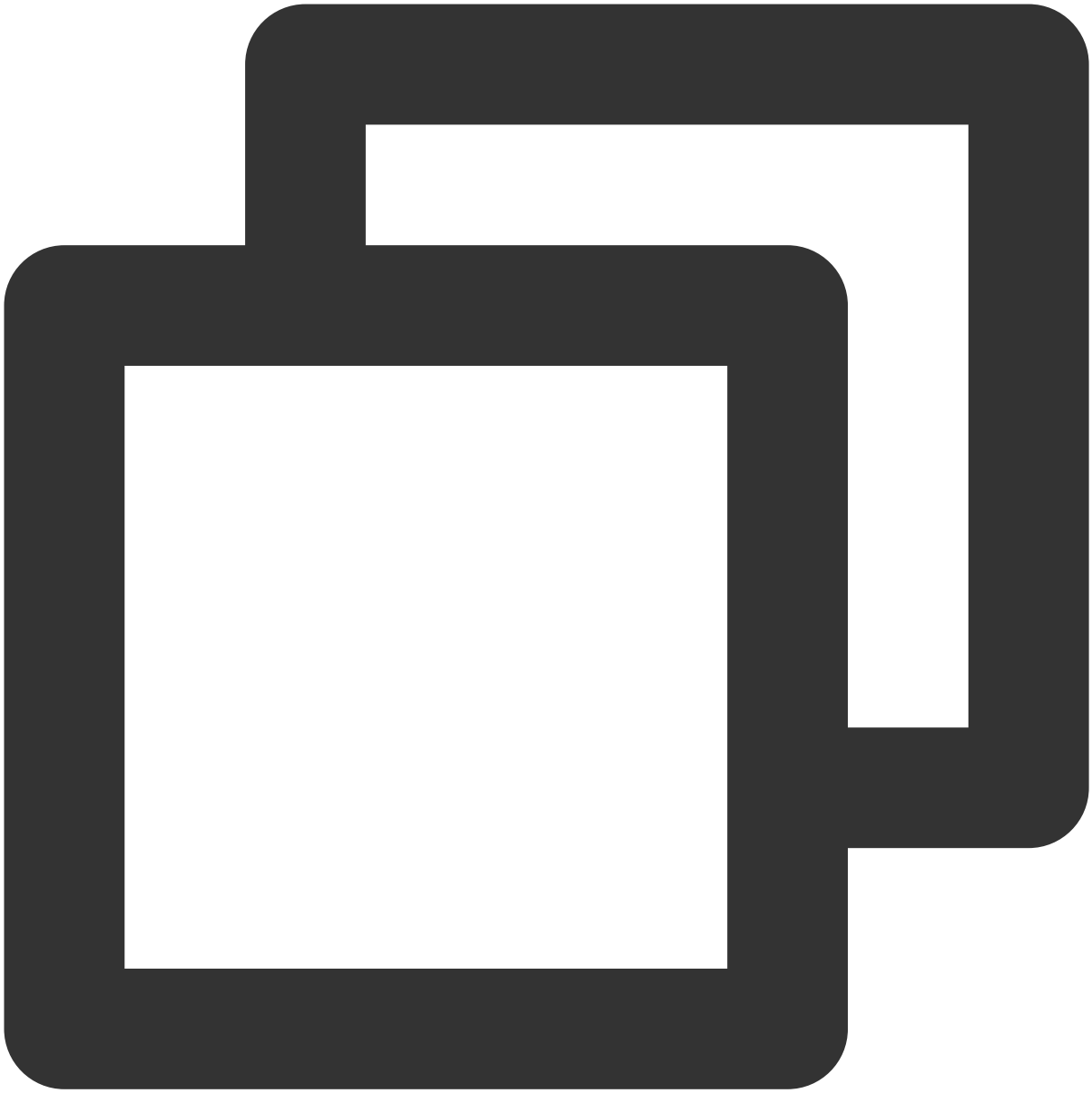

```
# Suppose the requested Nacos address is `10.0.120.11:8848`
-Dspring.cloud.nacos.discovery.server-addr=10.0.120.11:8848
```

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Deleting Application

Last updated：2024-01-09 12:40:53

Overview

This document describes how to delete an application instance in the TEM console.

Directions

1. Log in to the TEM console.
2. In the left sidebar, click **Application Management** to go to the application list page and select a deployment region for your application.
3. Click **Delete** in the **Operation** column of the target application.
4. Select **Delete** in the pop-up window to delete the instances of the application in an environment.

Note:

If the application is deployed in multiple environments, only the instances in a certain environment will be deleted.

If the application is deployed in only one environment, the instances in the environment will be deleted, and you can also select to delete the application at the same time.

If the application has no instances deployed, the application will be deleted.

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Auto Scaling

Last updated：2024-01-09 12:40:53

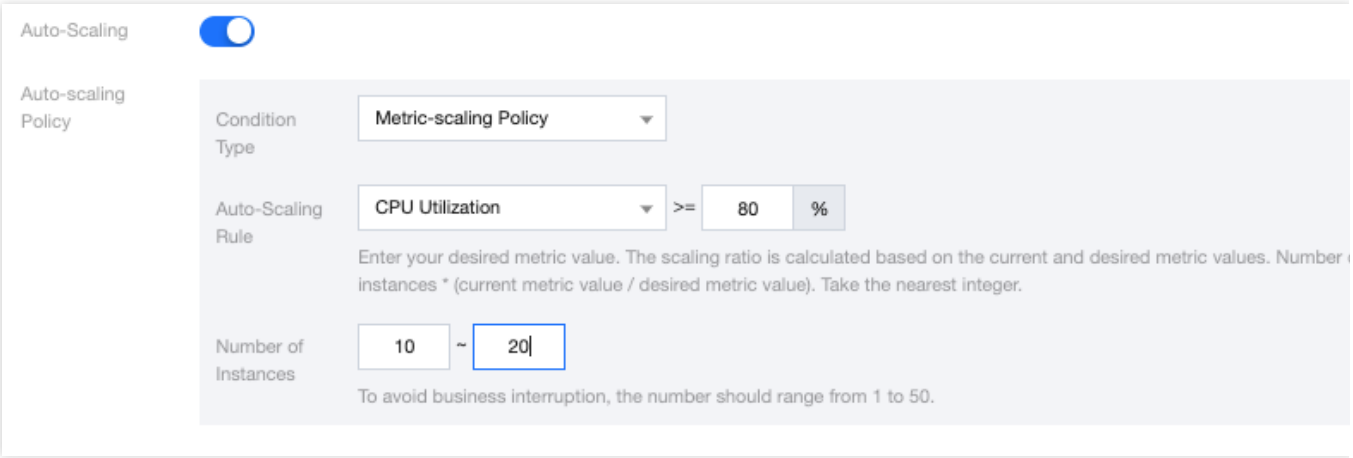
Overview

This document describes how to modify the number of service instances in the TEM console.

Directions

1. Log in to the TEM console.
2. In the left sidebar, click **Application Management** to go to the application list page and select a deployment region for your application.
3. Click the ID of the target application to go to the application details page.
4. Click **Edit and Update** in the **Auto-Scaling** module and configure the instance count change policy.

Scheduled Policy: specify the instance trigger time and the number of instances to trigger. You can configure multiple trigger conditions but only one of them can take effect.



Metric-scaling Policy: enter an expected metric value. The system will calculate the scaling ratio according to current and expected metric values.

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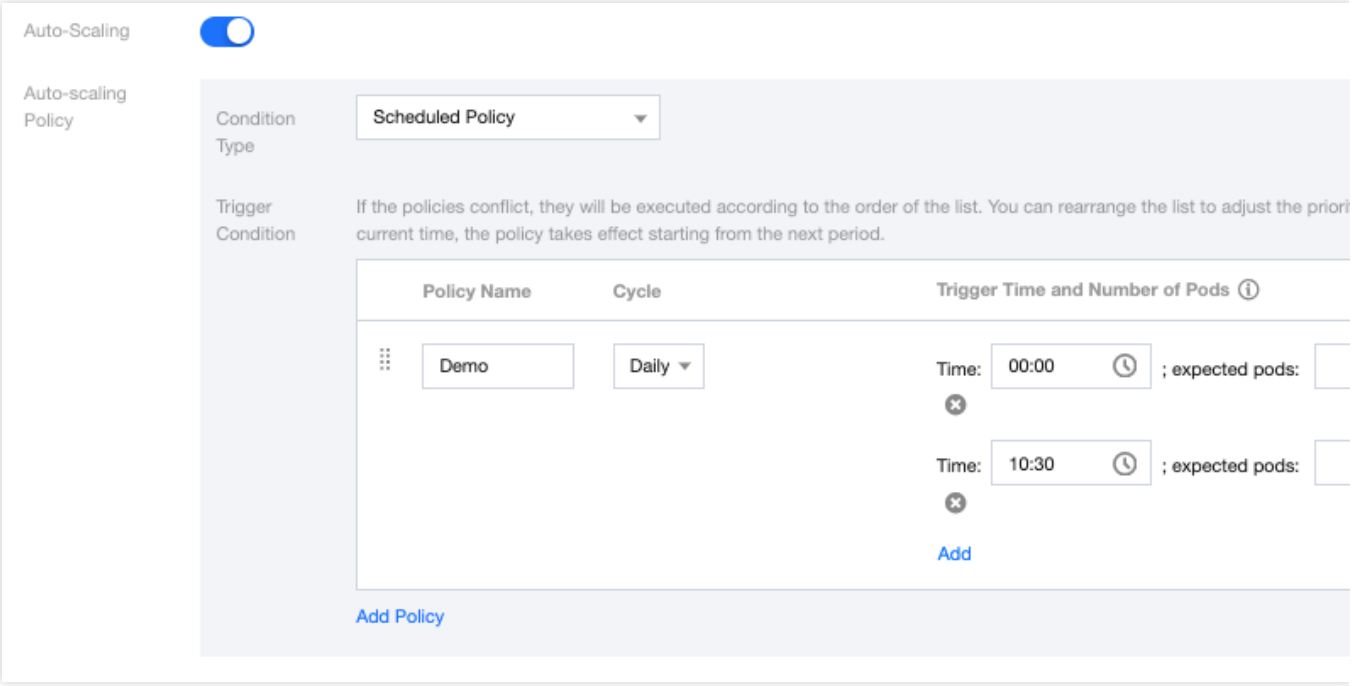

5. Click **Submit** to modify the number of instances.

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Logging in to Container via WebShell

Last updated：2024-01-09 12:40:53

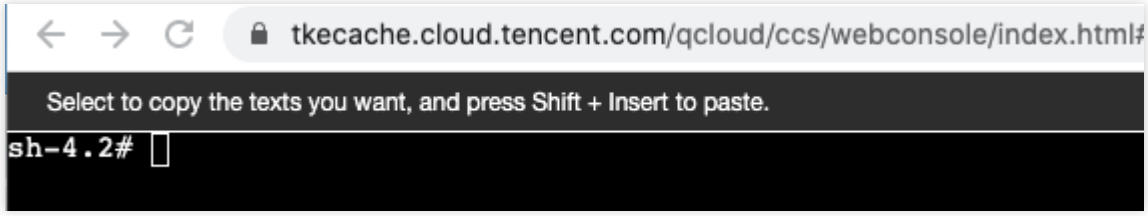
Overview

This document describes how to log in to a container via WebShell in the TEM console.

Directions

1. Log in to the TEM console.
2. In the left sidebar, click **Application Management** to go to the application list page and select a deployment region for your application.
3. Click the ID of the target application to go to the application details page.
4. Select the **Application List** tab, click **WebShell** in the **Operation** column of the target instance, and log in to the container via WebShell. `sh` is supported by default.

The UI after login is as follows:



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Viewing Application Log

Last updated：2024-01-09 12:40:53

Overview

This document describes how to view the log information of a created application.

Prerequisites

You have created an application.

Directions

1. Log in to the TEM console and click **Application Management** in the left sidebar to go to the application list page.
2. Select the target application and click the application ID to go to the application details page.
3. On the **Log** tab on the application details page, you can view the log information under the current application (for real time, last 24 hours, last 7 days, last 15 days, last 30 days, or a custom time range).

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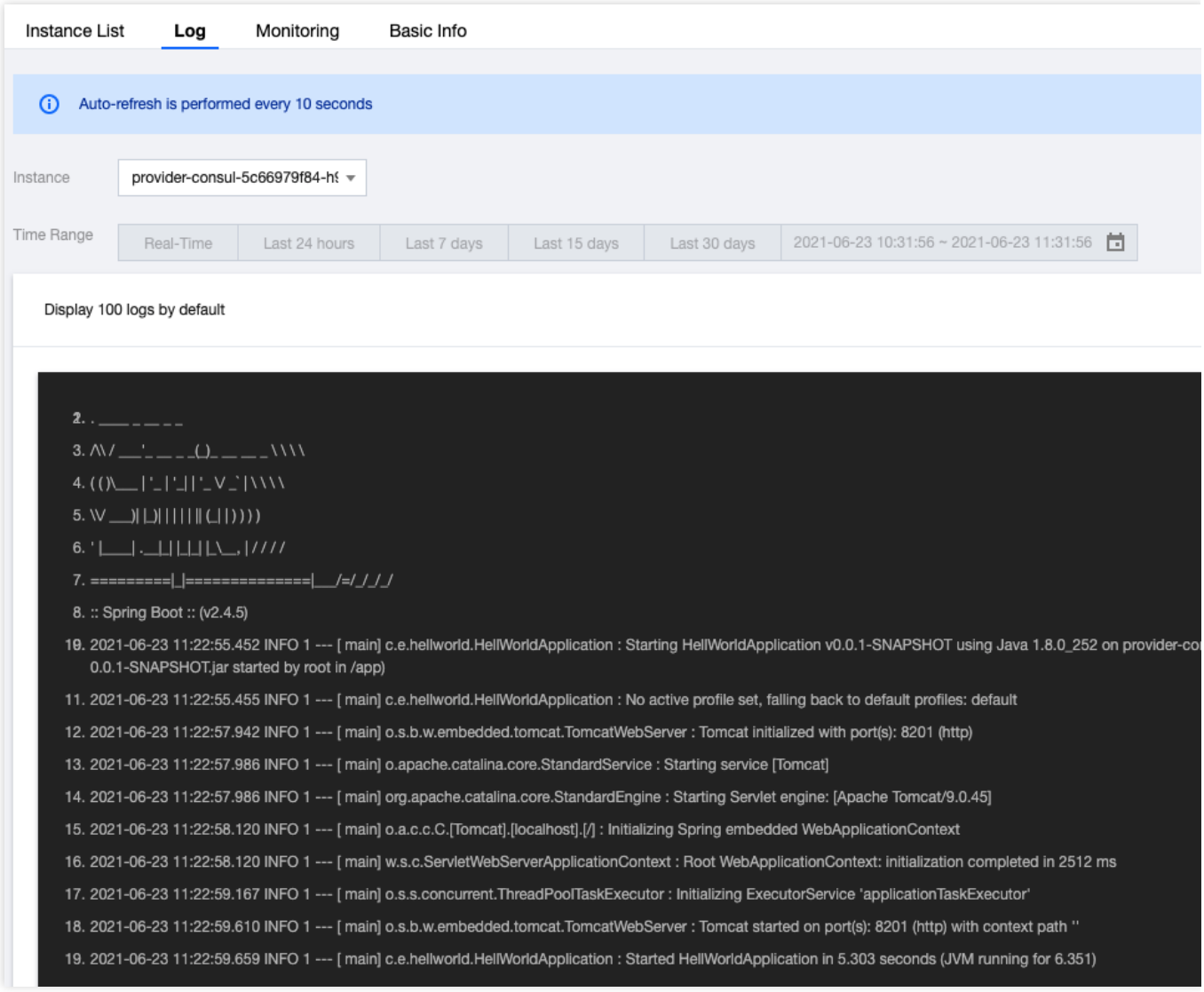

4. You can click

to automatically refresh the log information.

5. You can click

to export the logs to your local file system.

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Viewing Application Monitoring Information

Last updated：2024-01-09 12:40:53

Overview

This document describes how to view the monitoring data of a created application.

Prerequisites

You have created an application.

Directions

1. Log in to the TEM console and click **Application Management** in the left sidebar to go to the application list page.
2. Select the target application and click the application ID to go to the application details page.
3. On the **Monitoring** tab on the application details page, you can view the CPU and memory utilization details under the current application (for real time, last 24 hours, last 7 days, last 15 days, last 30 days, or a custom time range).
4. You can click

to download the relevant monitoring data.

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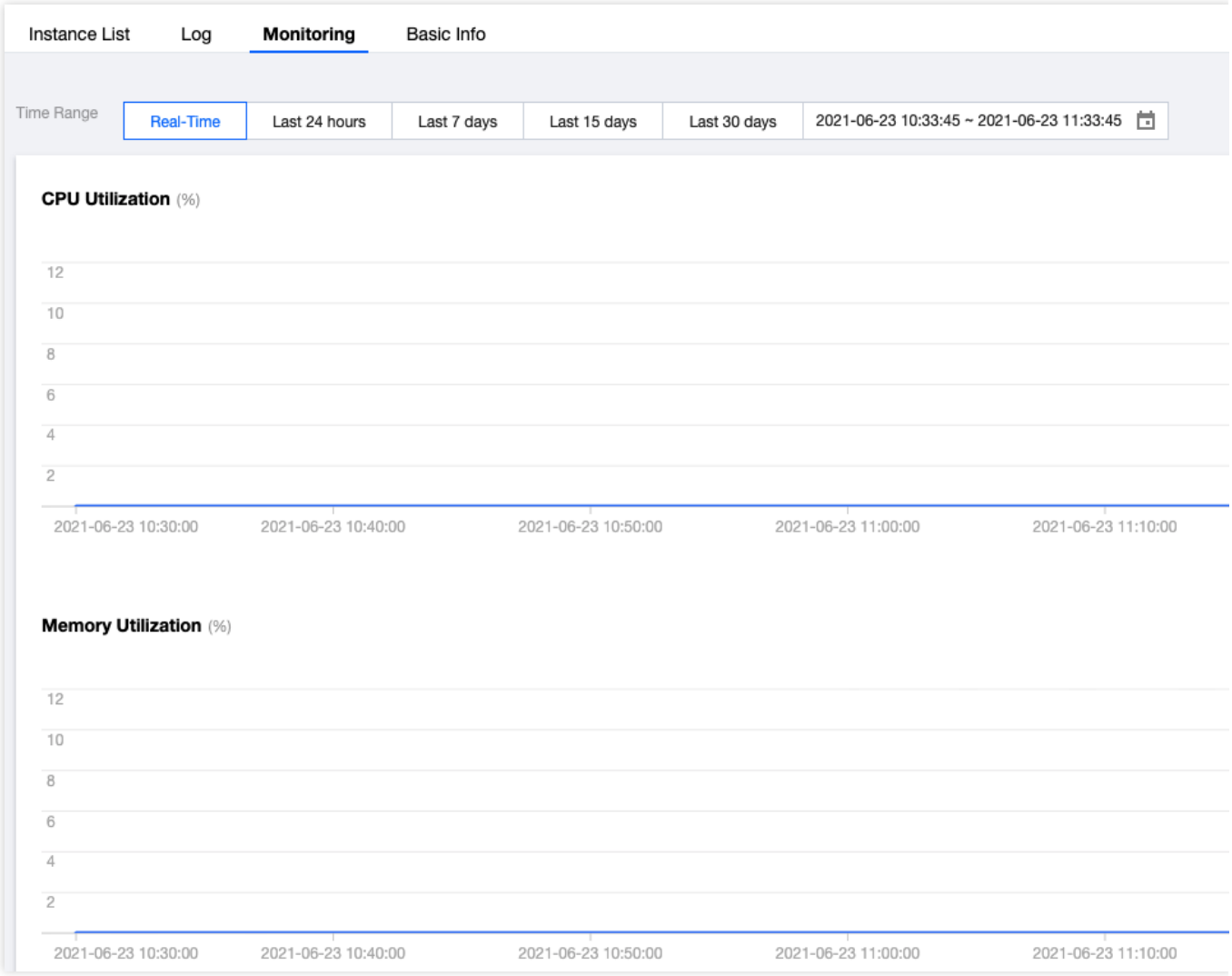

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Rolling Back Application

Last updated：2024-01-09 12:40:53

Overview

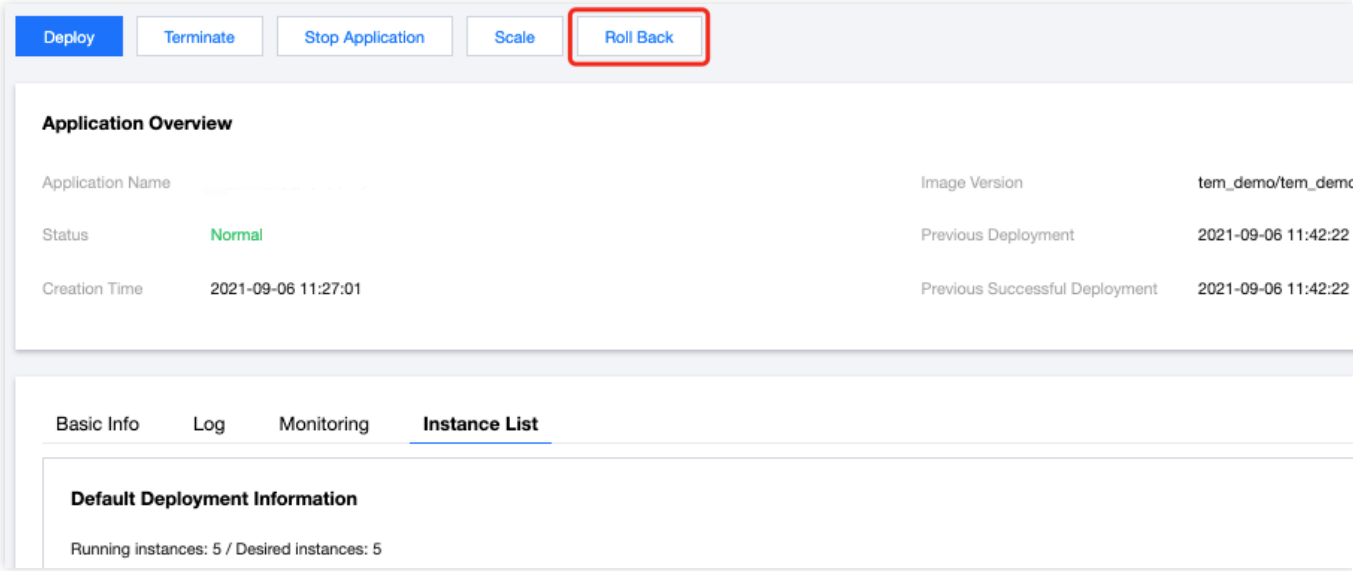
This document describes how to roll back a deployed application to its previous version.

Prerequisites

You have created and deployed an application.

Directions

1. Log in to the TEM console and click **Application Management** in the left sidebar to go to the application list page.
2. Select the target application and click the application ID to go to the application details page.
3. On the application details page, click **Rollback**.



4. In the pop-up rollback window, select a historical version to be rolled back to in the **Historical version** area.

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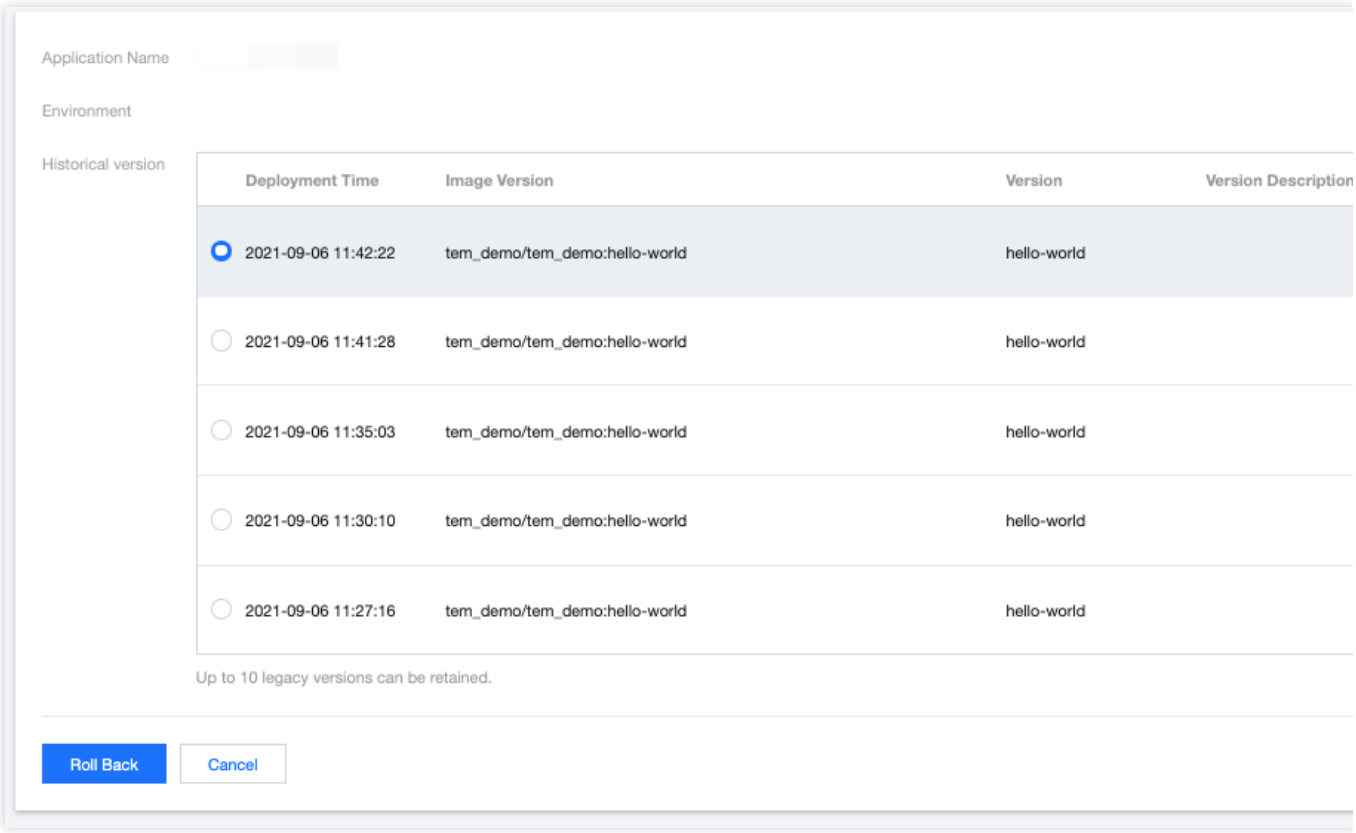

Up to 10 historical versions can be retained.

Deployment Result: **Deployed successfully** or **Failed to deploy**.

Application Details: displays the configuration information of the application deployment.

Download: If the historical version was uploaded using a JAR or WAR package, you can download the corresponding package in the list.

5. Click **Rollback** to redirect to the **Instance List** page. The system will roll back the application to the specified historical version in a rolling deployment mode.

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Activating Image Repository

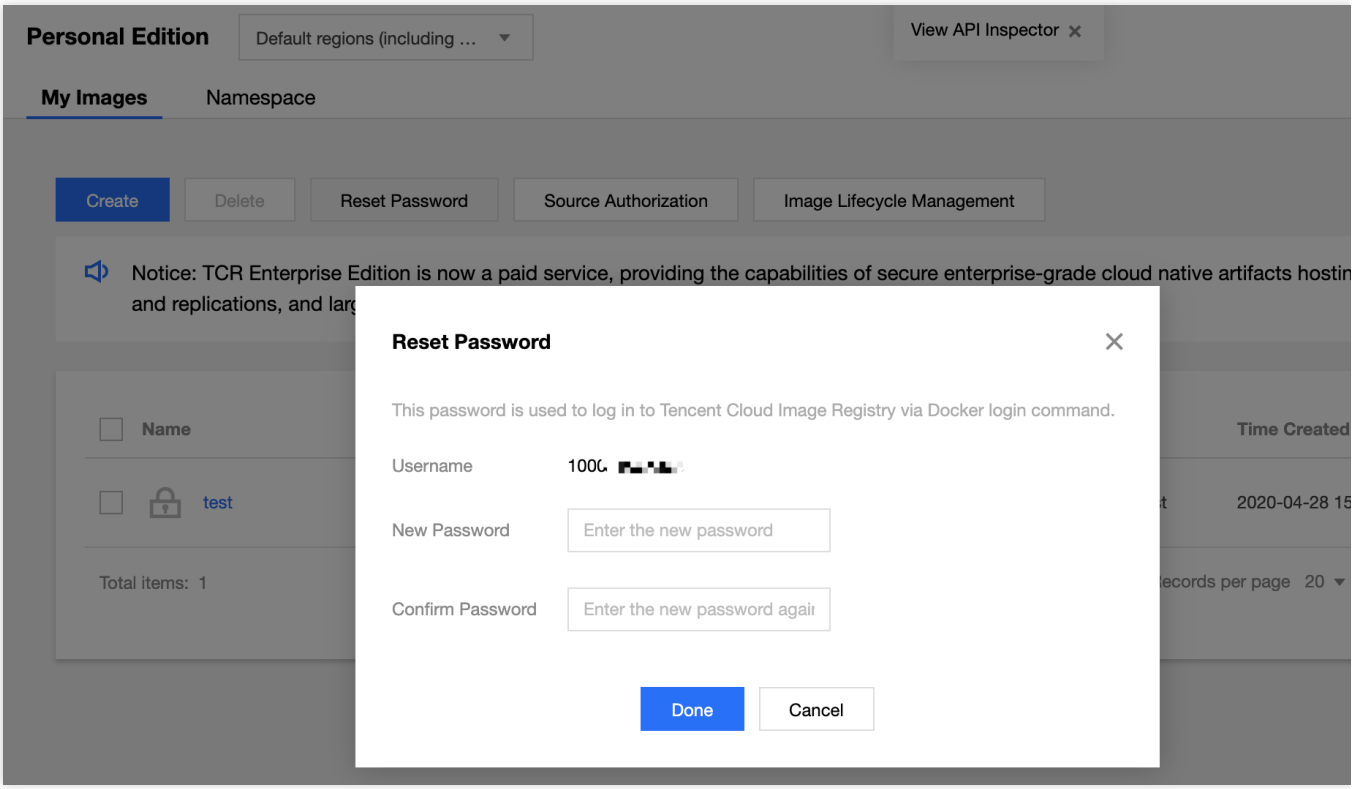
Last updated：2024-01-09 12:40:53

Overview

This document describes how to create a Personal Edition image repository in the TKE console to receive container images built or pushed by TEM.

Directions

1. Log in to the TKE console and enter the **Image Repositories** > **Personal Edition** page. If you are accessing this service for the first time, the initialization page will be displayed.



2. Select the region of the application environment.
3. Set a password for your personal container image repository, which can be used to log in to the repository through `docker login` .
4. After the personal image repository is activated, you can return to the TEM console to create an application.

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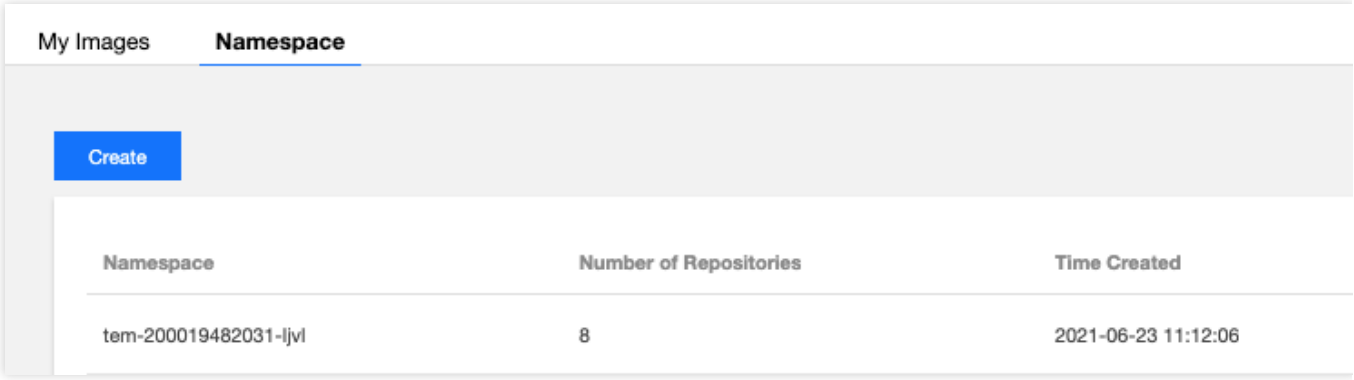
If you select **Image** > **Auto Create** for package upload, the image you upload will be pushed to the namespace created by TEM.
If you select **JAR** or **WAR** for package upload, TEM will automatically build a container image for you and push it to the namespace created by TEM.



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Batch Deployment

Last updated：2024-01-09 12:40:53

Overview

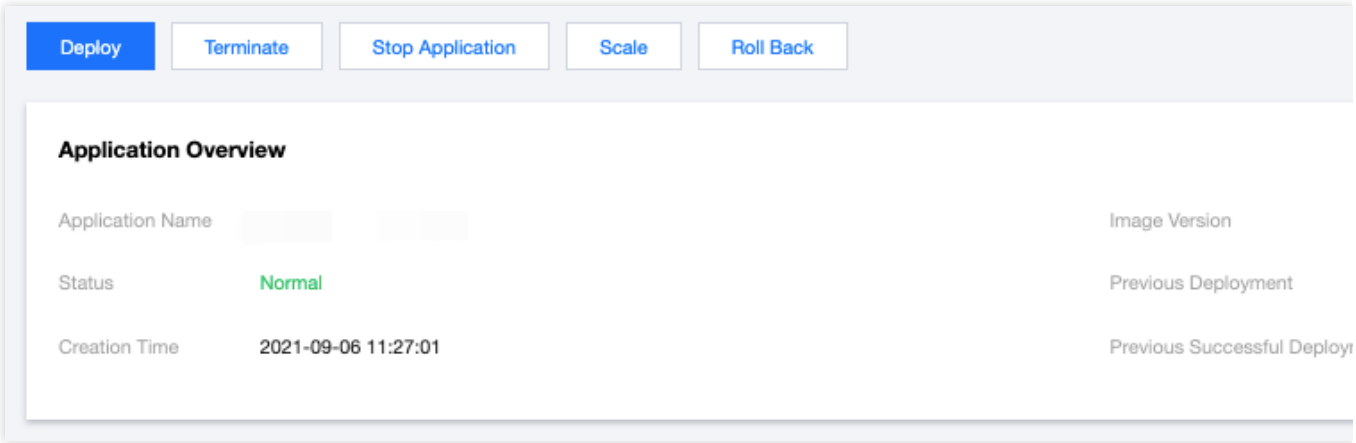
In service rollout and upgrade scenarios, the stability of the deployment process and application is extremely important. This document describes how to use batch deployment to ensure deployment stability when the application is deployed again.
The batch deployment feature allows you to deploy applications in multiple batches. Each batch updates only a part of the running instances of an application. In addition, you can suspend manual verification and rollback to avoid the impact of faults and the fluctuations in the deployment process.

Prerequisites

You have created and deployed an application.

Directions

1. Log in to the TEM console and click **Application Management** in the left sidebar to go to the application list page.
2. Select the target application and click the application ID to go to the application details page.
3. On the application details page, click **Deploy** to go to the redeployment details page.



4. On the deployment details page, configure batch deployment in the **Deployment Policy** area.

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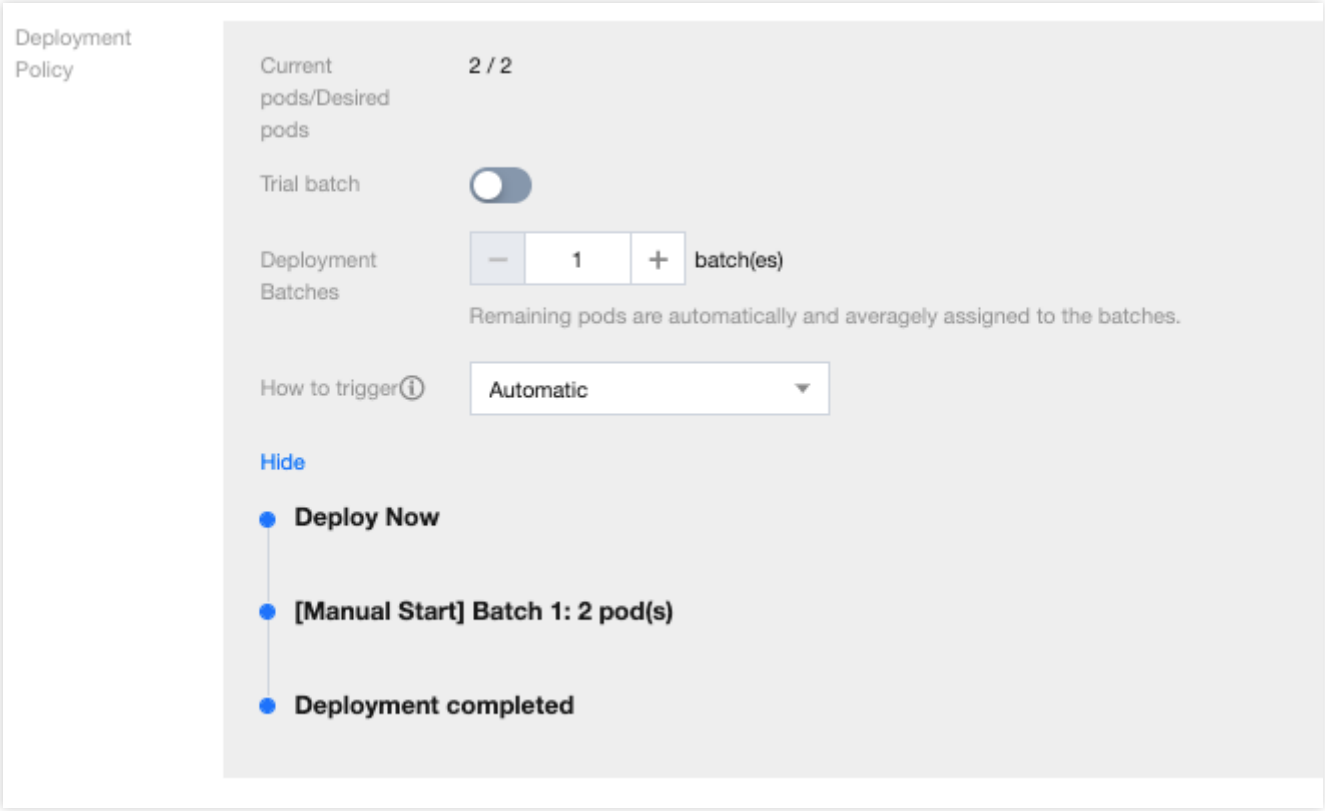


If your application has more than one running instance, redeployment automatically triggers batch deployment.

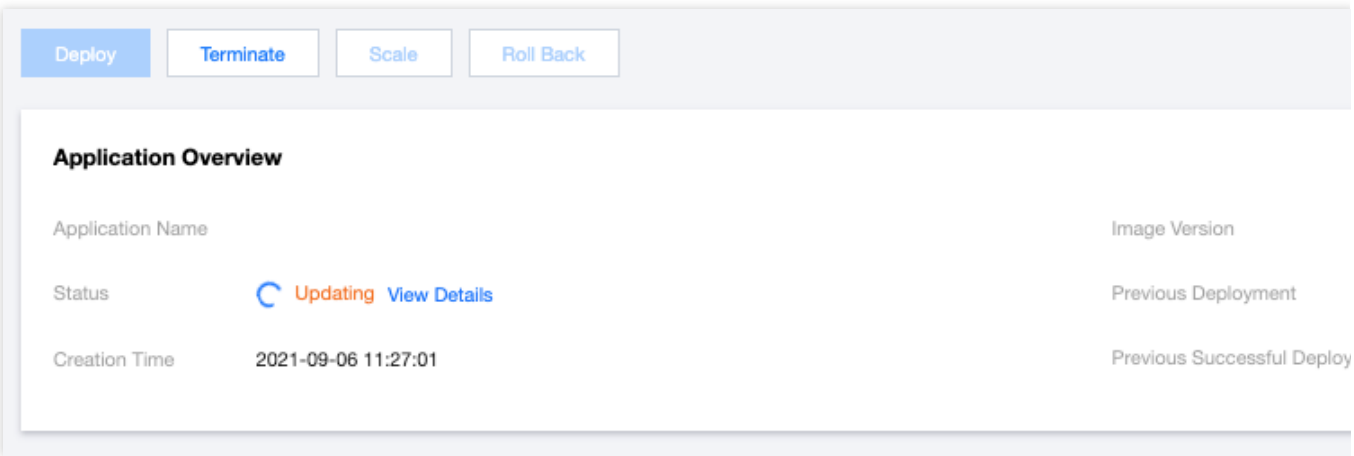
Trial Batch: you can specify a trial batch that contains no more than 50% of the total number of instances. After the execution of the trial batch is completed, you need to manually start the remaining batches.

Deployment Batches: select the number of batches to launch. Then all instances will be evenly distributed across batches.

How to trigger: you can choose either to manually or automatically (at an interval of 5 minutes) start the next batch.

Deployment flowchart: you can expand the flowchart to view the deployment process and batch details.

5. Click **Deploy** to redirect to the **Instance List** page to start deployment.



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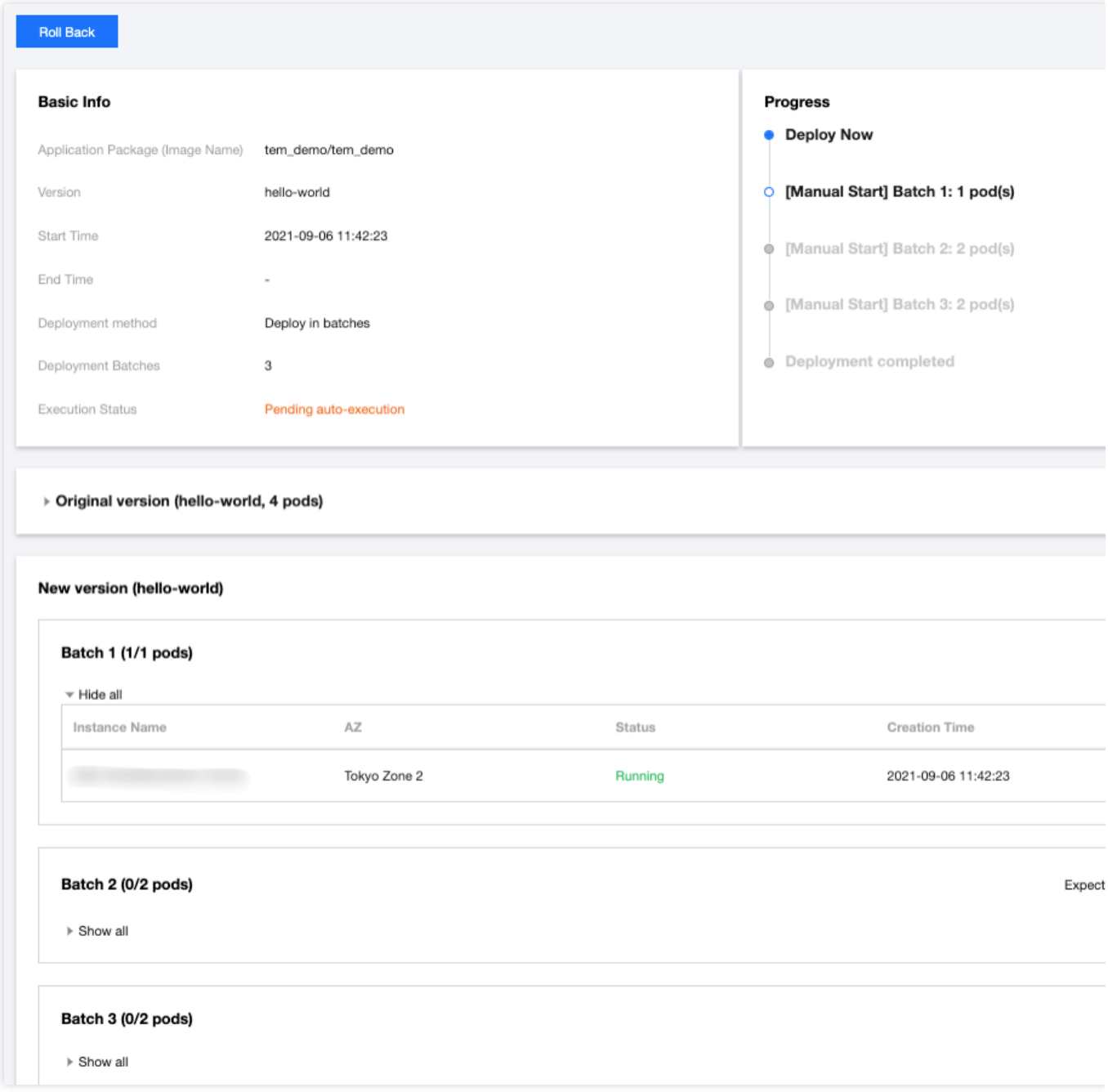
6. Click **View Details** in the **Status** parameter in the **Application Overview** area. You can view and manage the batch deployment process in the deployment list.



Rollback is to terminate the current deployment process and restore all instances to their previous versions.

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Health Check

Last updated：2024-01-09 12:40:53

Overview

During the running of an application instance, the process may exit due to an exception, or the instance may run abnormally because the running environment disk is too full, and so on. In such cases, you need to restart the application instance.
In addition, the application instance may be temporarily unable to receive new requests due to database and other access exceptions. In that case, you need to remove the exceptional instance from the load balancer and add the instance to the load balancer when the instance recovers.
For the above two types of OPS requirements, TEM provides two types of health checks to meet the requirements of automatic OPS:
Liveness check: check whether an application instance is running properly. If not, restart the instance.
Readiness check: check whether an application instance is ready. If not, stop forwarding traffic to the instance.
Overall process
TEM provides the HTTP request method for health checks, and the corresponding HTTP APIs need to be provided by the application itself. Therefore, the overall process of using the health check feature consists of two steps:
1. Implement health check HTTP APIs in the application.
2. Configure the health check feature when deploying the application on the TEM platform.

Directions

Step 1: implement health check HTTP APIs in the application

The application needs to implement the health check HTTP APIs based on the development language and framework used. The following are some common examples in the industry:
Spring Boot
ASP.NET Core
Django
Nodejs
The application needs to implement two health check HTTP APIs to handle liveness and readiness checks separately (in this example, the request paths for the liveness and readiness checks are set to `/livez` and `/healthz` respectively).

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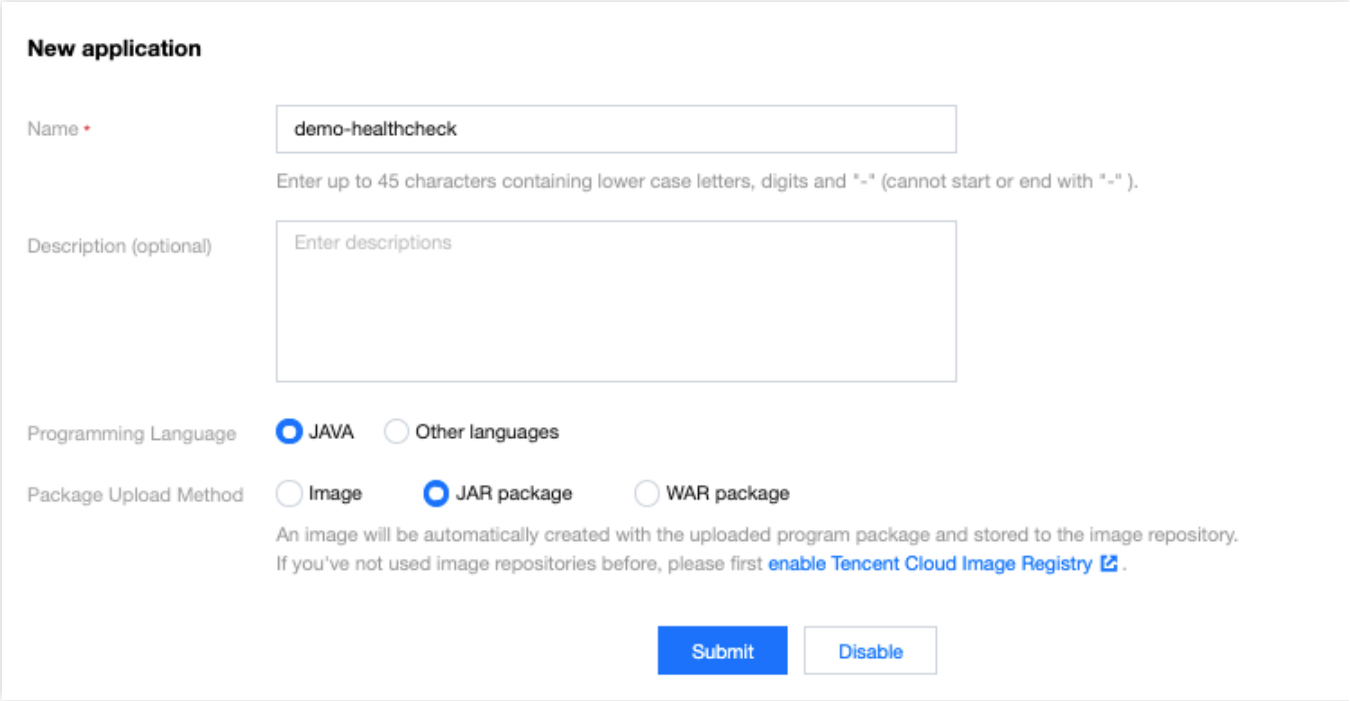
Step 2: configure the health check feature when deploying the application on the TEM platform

If no environment is created, create an environment.

Create and deploy an application as follows (a JAR package is used in this example):

1. Select the application deployment region at the top of the **Application Management** page in the TEM console.
2. Click **Create** to access the **New application** page and enter the application information.



3. Click **Submit** and click **OK** in the pop-up window to deploy the application.
4. On the **Deploy Application** page, configure the relevant parameters as needed.

Set **Request Path** and **Port** to the HTTP API path and port number for health check respectively.

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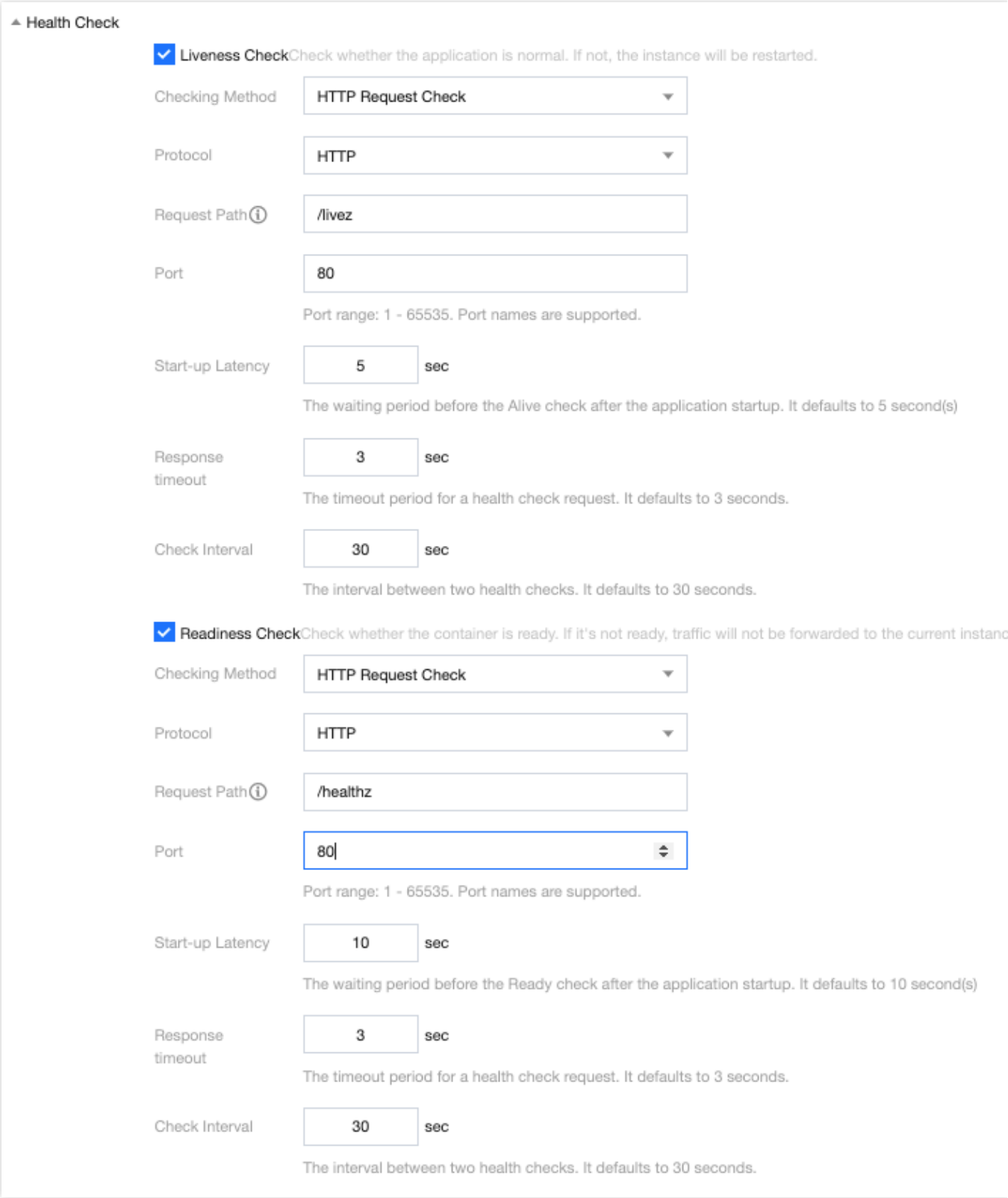

5. Click **Deploy Application**. The platform automatically manages the application according to the health check configuration.

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Permission Management Overview

Last updated：2024-01-09 12:40:53

TEM currently allows the **root account** to configure and grant TEM operation and resource permissions to sub-accounts flexibly in the console.

Overview

A TEM permission policy specifies the **operation scope** and **resource scope**. A complete permission policy can define all operations that can be performed by the policy holder on the specified resources.

Resource Type	Resource Scope	Operation Scope
Environment	Specified/All environments	View environment details: This option includes read operations and deployment operations (deploying applications and associate gateways to the environment) of the environment. Manage environment: This option includes the read, deployment, and write operations of the environment.
Application	Specified/All applications	View application details: This option includes the read operations of the application. **Manage application:** This option includes the read and write operations of the application.
CLB gateway	Specified/All CLB gateways	View CLB gateway details: This option includes the read operations of the CLB gateway. Manage CLB gateway: This option includes the read and write operations of the CLB gateway.

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Creating and Granting Permission Policy

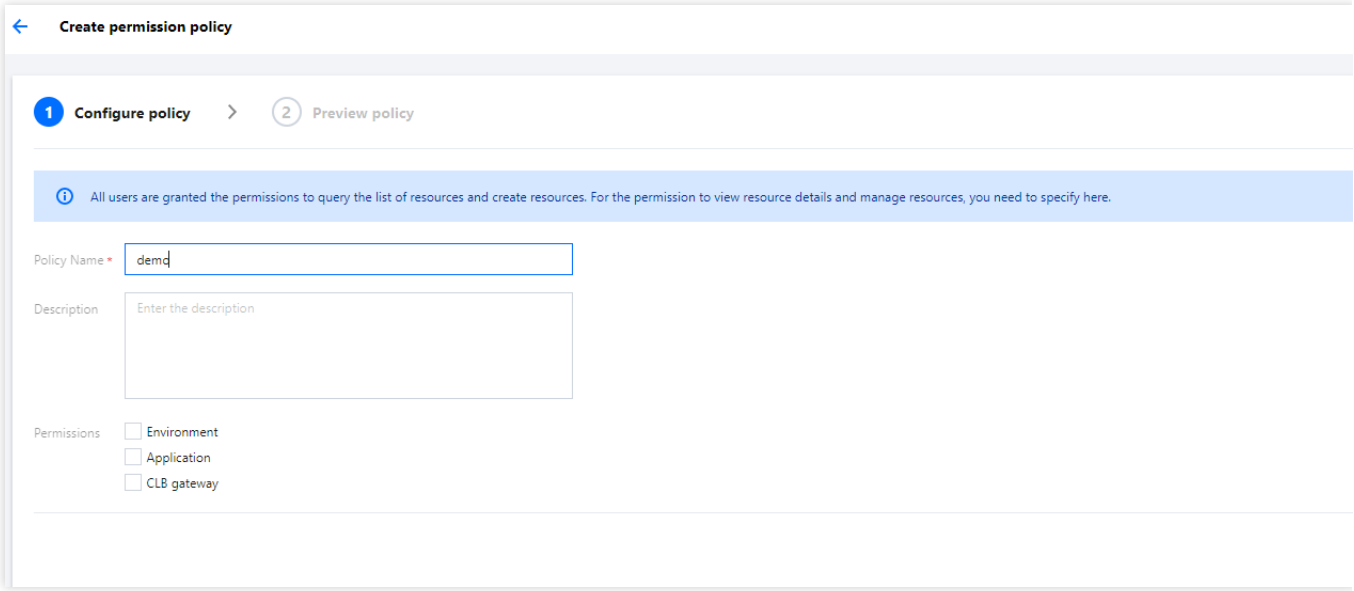
Last updated：2024-01-09 12:40:53

Overview

This document describes how to **configure a permission policy in the TEM console** and use CAM to **grant the policy to a sub-account**.

Directions

1. Log in to the TEM console and click **Permission management** on the left sidebar.
2. On the **Permission management** page, click **Create permission policy** and enter a policy name and description.



3. (Optional) Authorize environment resources:

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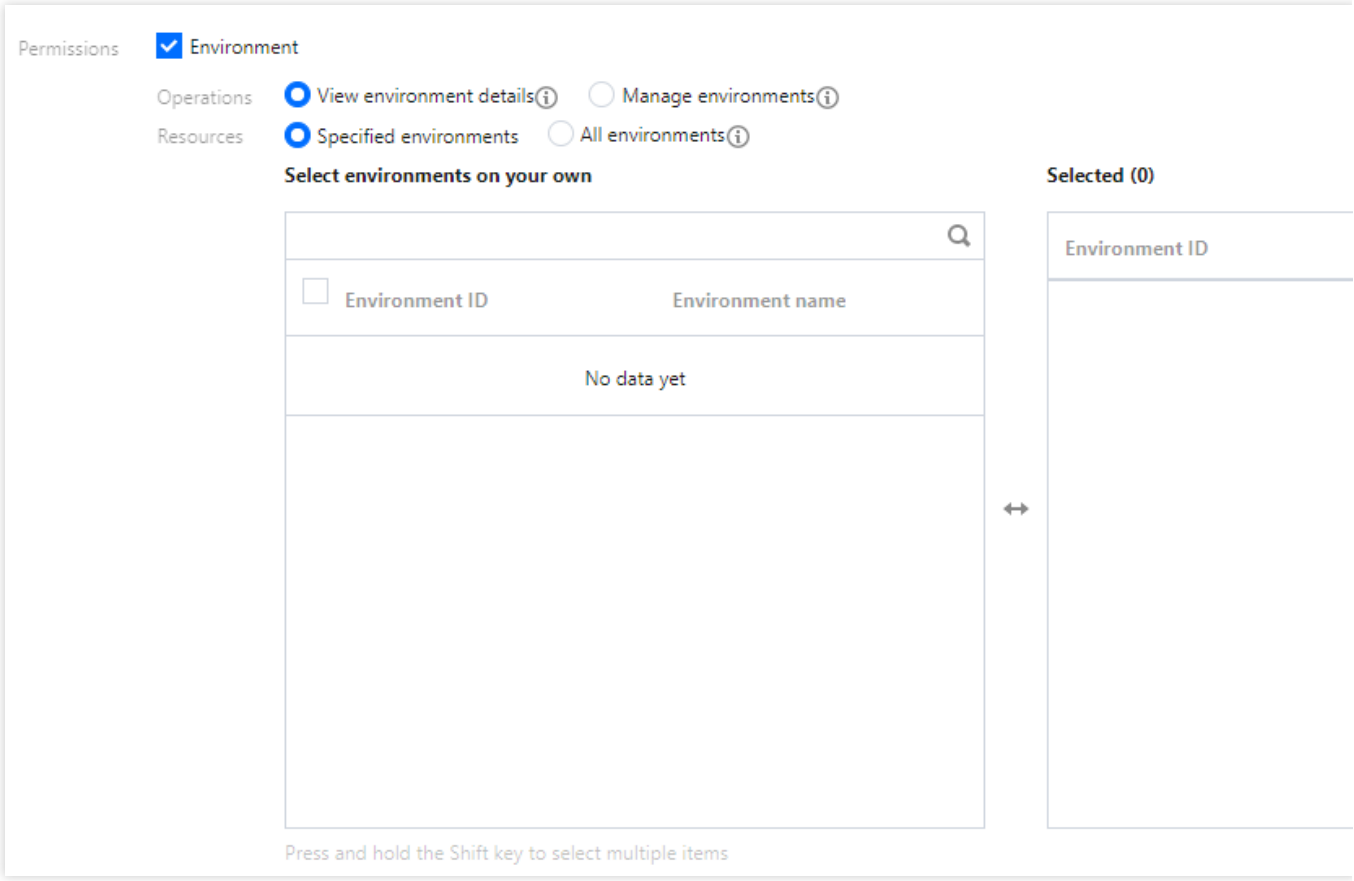

Select **Environment** and select the operation and resource scopes in the options expanded below.

Select the scope of environment operations to be authorized:

View environment details: This option includes read operations and deployment operations (deploying applications and associate gateways to the environment) of the selected environment.

Manage environment: This option includes the read, deployment, and write operations of the selected environment.

Select the scope of environment resources to be authorized:

Specified environments: You can select resources in the resource selector below.

All environments: This option refers to all existing environments and includes those added subsequently.

4. (Optional) Authorize application resources:

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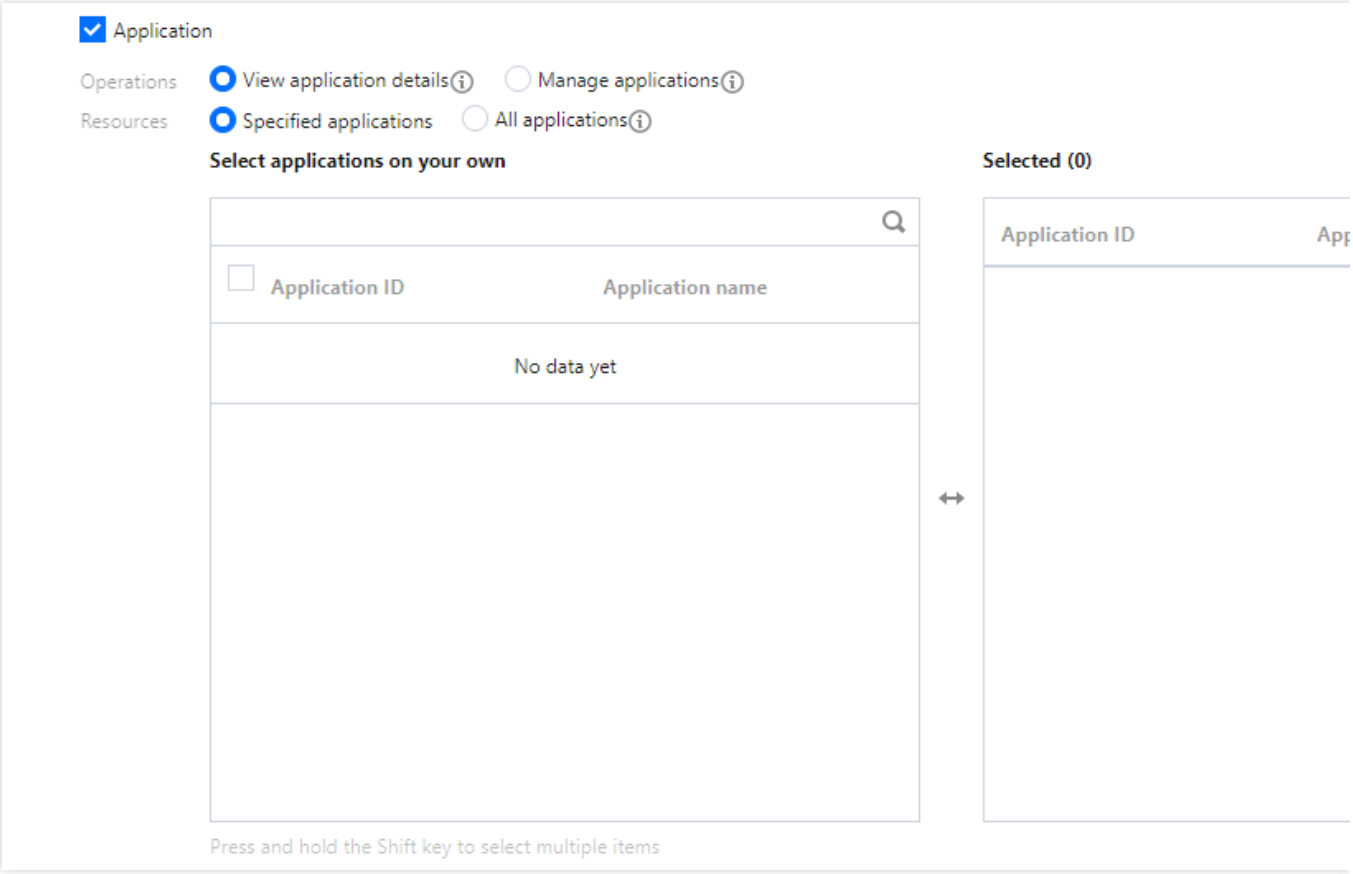

Select **Application** and select the operation and resource scopes in the options expanded below.

Select the scope of application operations to be authorized:

View application details: This option includes read operations of the selected application.

Manage application: This option includes the read and write operations of the selected application.

Select the scope of application resources to be authorized:

Specified applications: You can select resources in the resource selector below.

All applications: This option refers to all existing applications and includes those added subsequently.

5. (Optional) Authorize CLB gateway resources:

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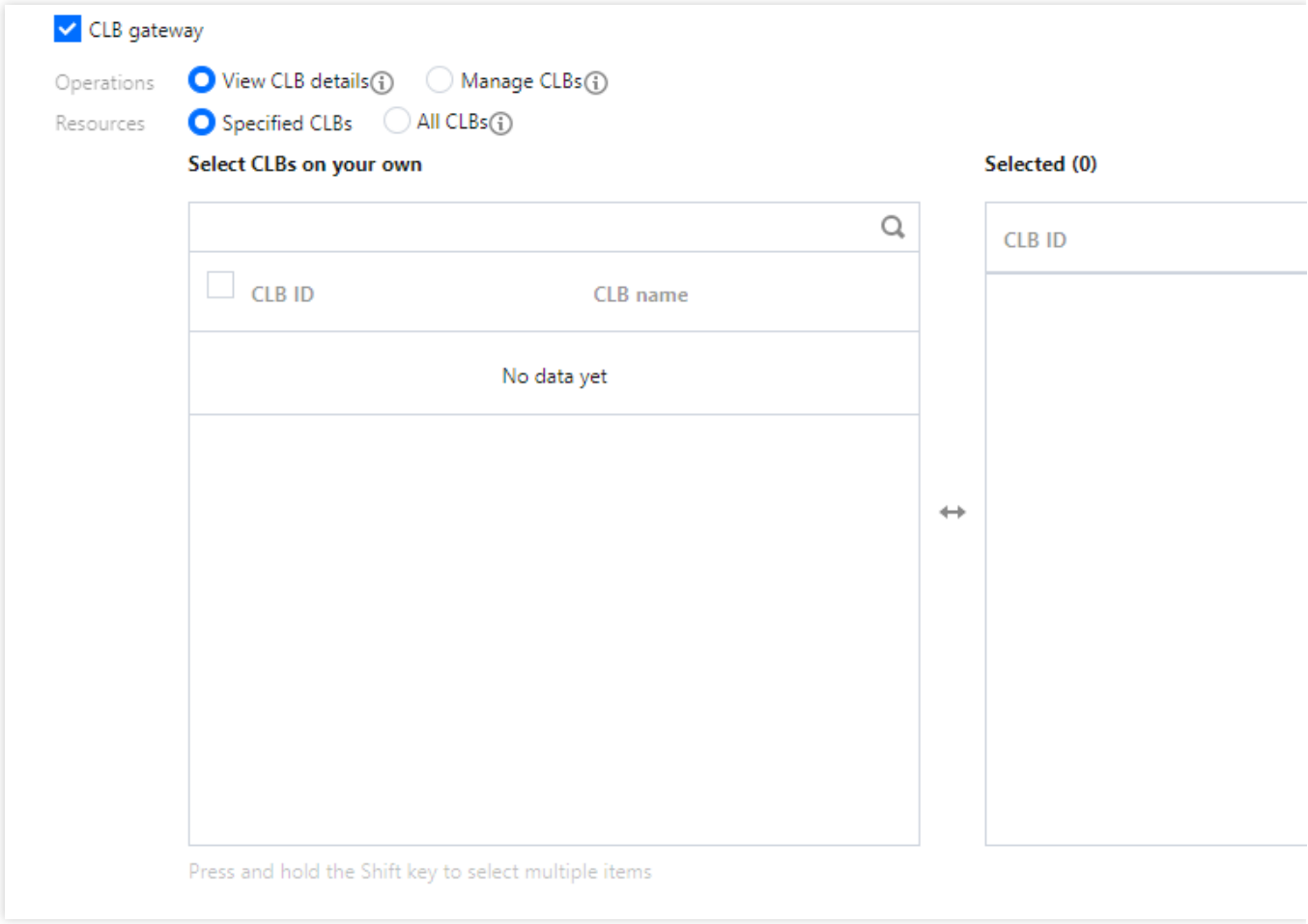

Select **CLB gateway** and select the operation and resource scopes in the options expanded below.

Select the scope of CLB gateway operations to be authorized:

View CLB gateway details: This option includes the read operations of the selected CLB gateway.

Manage CLB gateway: This option includes the read and write operations of the selected CLB gateway.

Select the scope of CLB gateway resources to be authorized:

Specified CLB gateway: You can select resources in the resource selector below.

All CLB gateways: This option refers to all existing CLB gateways and includes those added subsequently.

6. Preview the configured permission policy content, confirm that everything is correct, and click **Confirm and go to CAM for authorization**. You will be redirected to the **CAM Policy Generation** page.

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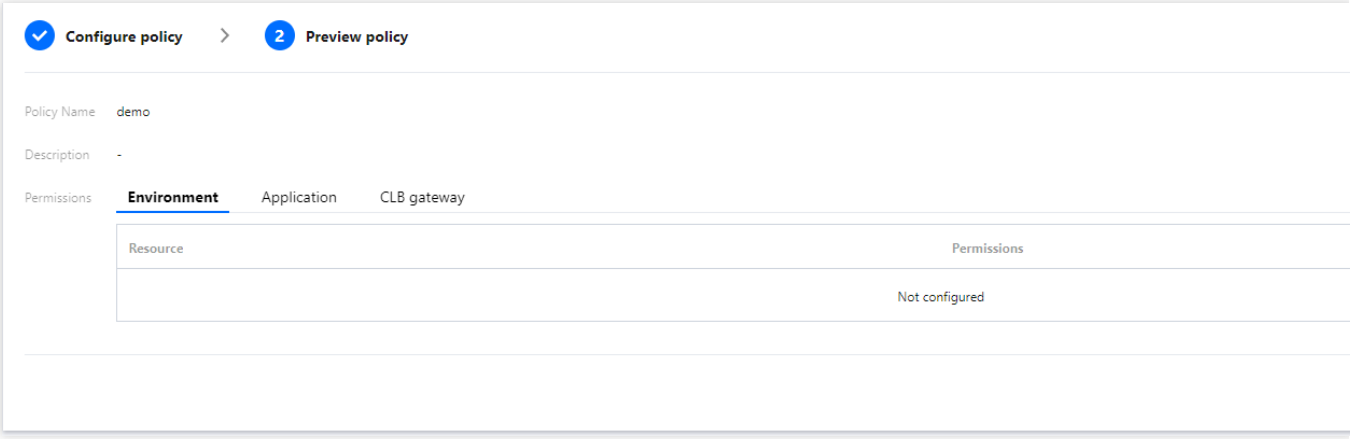

7. **Generate the corresponding permission policy** in CAM and click **Complete**.

Note:

Do not modify the generated policy content; otherwise, the policy may not take effect.

8. **Associate the generated policy to the target users/user groups** to complete authorization.

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Granting Existing Permission Policy

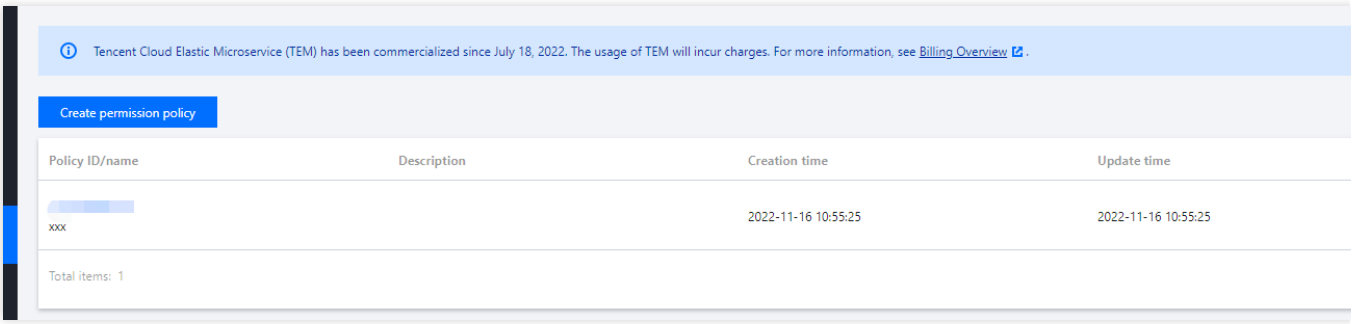
Last updated：2024-01-09 12:40:53

Overview

This document describes how to grant an existing TEM permission policy to a sub-account through CAM.
If you have completed authorization in CAM when creating a policy, you can directly grant the policy to other users/user groups in the CAM console. If the policy generated in CAM is deleted or cannot be found, generate the corresponding CAM policy and grant it as follows:

Directions

1. Log in to the TEM console and click **Permission management** on the left sidebar.
2. In the permission policy list, select the target policy and click **Generate CAM policy**.



3. In the CAM console, create a policy, click **Complete**, and **associate the policy to the target users/user groups**.

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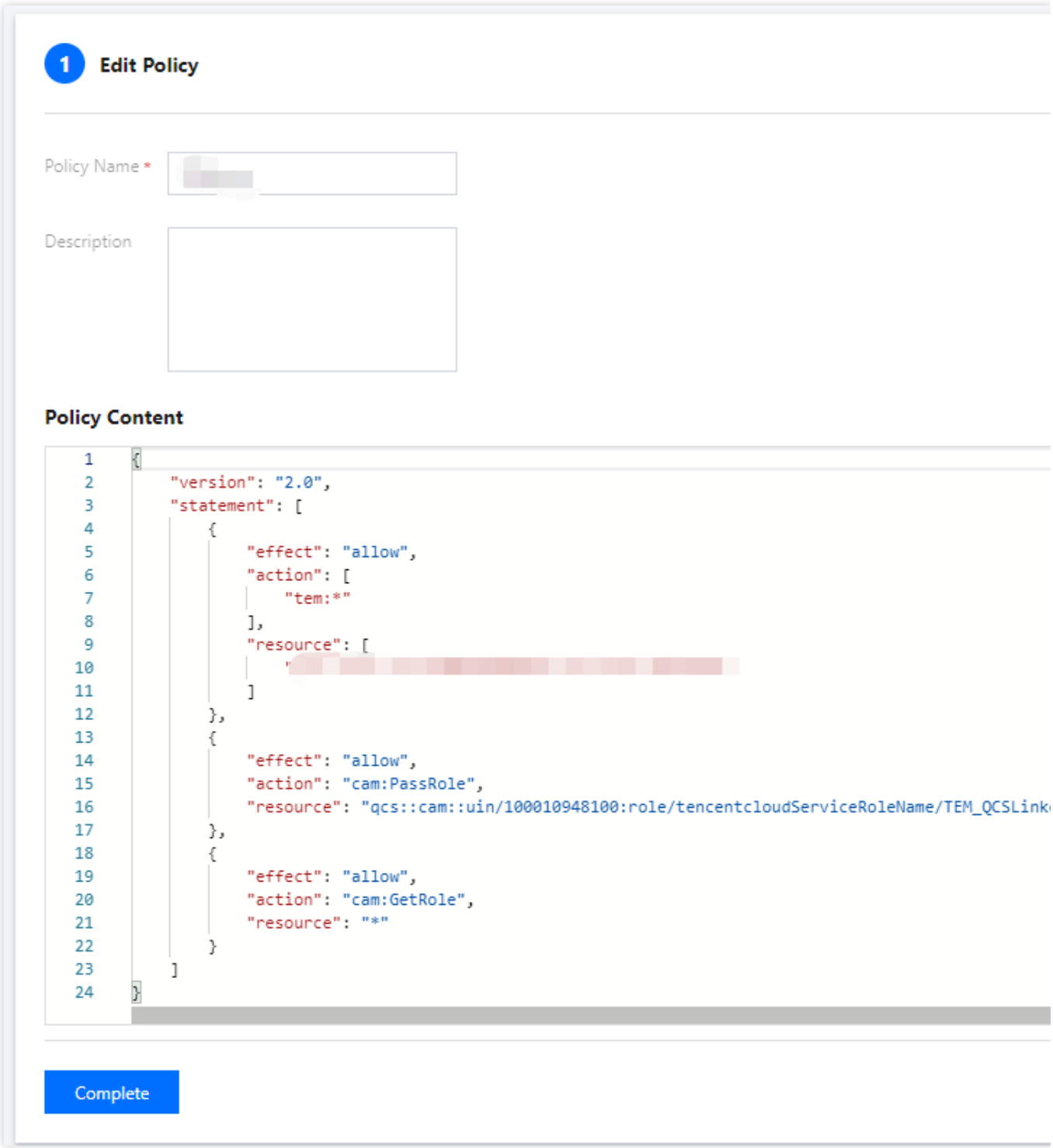

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View Change Record

Last updated：2024-01-09 12:40:53

Overview

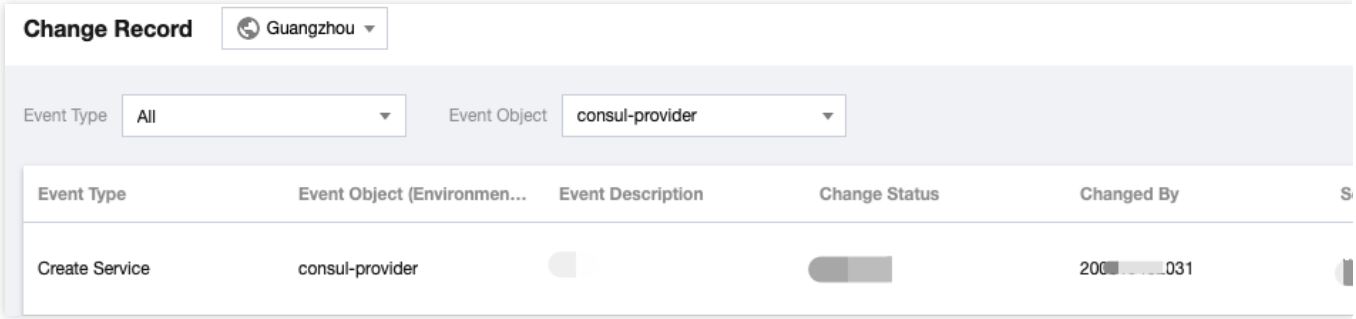
This document describes how to view change records in the console after an application is created.

Prerequisites

You have created an application.

Directions

1. Log in to the TEM console and click **Change Record** on the left sidebar to enter the change record page.
2. Selecting a deployment region at the top, select an event type and an event object, and then you can see the filtered change records.



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