

Tencent Smart Advisor–Chaotic Fault Generator

Product Introduction

Product Documentation



Tencent Cloud

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Contents

Product Introduction

Overview

Strengths

Scenarios

Product Introduction

Overview

Last updated: 2024-09-26 15:34:19

Tencent Smart Advisor-Chaotic Fault Generator (CFG) provides efficient, convenient, safe, and reliable fault injection services. In addition, it also provides industry templates, monitoring guardrails, and other core functions, and is committed to helping users promptly discover business disaster recovery risks and verify the effectiveness of high-availability plans, thereby improving system availability and resilience.

Basic Concepts

Before use of the CFG, understanding the relevant concepts will help you get started with product operations faster.

Concept	Description	Example
Chaos engineering	Chaos engineering is a discipline that conducts experiments on distributed systems. It updates the understanding of the system through practice, thereby understanding and discovering the unknown weaknesses of the system. The purpose is to build the ability and confidence of the system to resist out-of-control conditions in the production environment.	-
Experiment	The process of verifying and improving system availability by injecting specified faults into specified locations of the system and observing the experimental results.	-
Action	It refers to the atomic fault actions injected into the system during the experiment, including various fault injection scenes of IaaS, PaaS, and SaaS. In an experiment, users can freely combine and orchestrate multiple experiment actions. An action group is a collection of actions.	High CPU usage, CVM shutdown, and database primary/secondary switch
Object	The instance object that the action acts on.	CVM and MySQL
Template	Save valuable and frequently used experiments and scenes as experiment templates for quick reuse later. The templates include basic experiment information and action orchestration solution, and you only need to determine the experiment object for subsequent use.	Cross-AZ disaster recovery experiment template and network fault template

Monitoring metrics	To determine whether the system is running stably and whether the fault injection is successful, the system steady-state metrics can be configured in advance to observe changes in steady-state metrics during experiments, perceiving system changes in real time.	Disk usage (%)
Guardrail policy	Configure alarm metrics and trigger policies. When the alarm metrics reach the trigger threshold, the system can automatically stop the experiment and roll back the action to control the impact scope of the experiment.	If the disk usage (%) reaches 90%, the experiment will automatically stop.

Strengths

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Tencent Smart Advisor-Chaotic Fault Generator is a fault injection experiment platform based on the chaos engineering principle and Tencent Cloud best practices, providing users with a lifecycle solutions.

Abundant Fault Action Library

- It supports fault injection scenes for different objects such as CVM, network, and database, including nearly 100 fault atomic capabilities for IaaS, PaaS, and SaaS;
- It supports flexible combination and orchestration of multiple fault actions in one experiment.
- It supports custom action script injection to meet business personalized injection needs.

Typical Industry Templates

Tencent Cloud's internal practices and typical user scenarios are accumulated as industry templates for users to quickly reuse, greatly improving the efficiency of experiments.

- Industry templates provide practice plans for multiple industries such as e-commerce, games, and multimedia for users to choose from;
- Industry templates cover multiple typical use cases such as cross-AZ disaster recovery experiments and service stress experiments;
- It supports users to build custom template libraries to create experiments with one click, which is faster and more efficient.

Reliable Security Protection Policy

- It supports the configuration of cloud monitoring metrics to observe changes in steady-state metrics during experiments, perceiving system changes in real time;
- It supports the configuration of alarm policies, and can automatically stop the experiment after the safety fence is triggered, making the experiment more assured;
- The platform supports one-click termination of experiments and timeout rollback, ensuring business security in all aspects;
- Relying on Tencent Cloud CAM's permission control mechanism, refined experiment permission management is achieved;
- Action injection is mainly based on the API of specifications for each cloud product, which is efficient and secure.

Complete Experiment Report

- After the experiment is completed, you can export the experiment report (PDF) with one click to help review the experiment and record problems;
- The experiment report contains basic information, data statistics, and experiment execution log.

Scenarios

Last updated: 2024-09-26 15:34:19

Cross-AZ Disaster Recovery Experiment

Cross-AZ deployment on the cloud is a common disaster recovery architecture. When a single availability zone fails due to power, network, and natural disasters, the disaster recovery availability zone can still provide service for the outside world to ensure service continuity. Through cross-AZ disaster recovery experiments, you can:

- Verify the effectiveness of the cross-AZ disaster recovery architecture on the cloud;
- Learn about business disaster recovery performance, RTO and RPO;
- Verify the effectiveness of the alarm policy when an availability zone fault occurs.

Hybrid Cloud Disaster Recovery Experiment

To improve business disaster recovery capabilities, hybrid cloud deployment has become a common choice for enterprises to migrate to the cloud. Reasonable architecture design can effectively reduce the probability and impact of hybrid cloud service faults. Tencent Smart Advisor-Chaotic Fault Generator provides a convenient experimental method to help you conduct fault experiments in hybrid cloud scenarios. Through this experiment, you can:

- Verify the autonomy of services under stress scenarios;
- Verify the effectiveness of the hybrid cloud disaster recovery architecture;
- Learn about the performance of business faults when Tencent Cloud services are unavailable;
- Verify the effectiveness of fault alarms;
- Conduct routine fault experiments for hybrid cloud deployment.

Service Stress Experiment

In scenes such as e-commerce activities and flash sales, instantaneous high-concurrency access may cause critical services to face extreme stress or even crash, resulting in page freezes, request failures, and other faults, causing business damage. Chaos engineering experiments can help you discover such disaster recovery potential problems in advance and avoid risks:

- Verify the service's autonomy under stress scenes;
- Verify the performance of the service under stress scenes;
- Verify the effectiveness of service alarms under stress scenes.

Network Fault Experiment

In the gaming scene, a good system architecture has a higher tolerance to weak networks, and can make players basically unaware of ordinary network jitter. It can self-adjust when there is a moderate network fault, and will not be completely unavailable when there is a severe network fault. To ensure user experience, an excellent disaster recovery capability is required for services such as weak network protection, preloading, node acceleration, and concurrent scheduling. Through the experiment in this scene, you can:

- Check the disaster recovery capability of the backend modules and clients in network fault scenes.
- Verify the effectiveness and instantaneity of abnormal alarms when network faults occur.