

**Config**

# **Service Overview**

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# 1 What Is Config?

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## Description

Config allows you to search for, record, and continuously evaluate your resource configurations to make sure that your resources are in expected status.

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### NOTICE

To get full functionality of Config, you need to enable the resource recorder. If the resource recorder is disabled, you may fail to update your resource data, create and use rules, or to aggregate resource data. For details about how to enable and configure the resource recorder, see [Configuring the Resource Recorder](#).

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## Architecture


Config provides you with resource information, such as resource inventory, details, relationships, and change records. It stores your resource data every 24 hours and notifications of your resource changes every 6 hours. It will also notify you when a change is made to your resources. In addition, it enables you to use Config rules to evaluate your resources.

- **Viewing resource details:** You can set multiple search options to query your resources on Config console.
- **Viewing resource relationships:** You can view relationships between resources on Config console.
- **Viewing resource change records:** You can enable and configure the resource recorder to continuously monitor resource changes.
- **Sending notifications:** Config will notify you when a change is made to your resources after you have enabled the resource recorder and configured a Simple Message Notification (SMN) topic.
- **Storing resource change notifications:** Config will store your resource change notifications every 6 hours after you have enabled the resource recorder and configured an SMN topic and an Object Storage Bucket (OBS) bucket.

- **Storing resource snapshots:** Config will store your resource snapshots into the specified OBS bucket every 24 hours after you have enabled the resource recorder and configured an OBS bucket.
- **Evaluating resource compliance:** Config evaluates your resources using rules to check whether they are compliant or not.
- **Advanced query:** Allows you to customize queries with ResourceQL to search for your resources.
- **Resource aggregator:** A resource aggregator enables you to aggregate resource configurations and compliance data from multiple accounts or an organization, so that you can centrally view or search for resource data.
- **Conformance package:** A conformance package is a collection of rules. You can use conformance packages to centrally create and manage rules, and query compliance data.

## Access Methods

You can use either of the following methods to access Config.

- **Management Console**  
The console is a web-based UI, where you can perform operations easily. Log in to the [management console](#), click  in the upper left corner, and choose **Management & Governance > Config**.
- **Application Programming Interfaces (APIs)**  
To integrate Config into a third-party system for secondary development, you need to access the service by calling APIs. For details, see [Config API Reference](#).

# 2 Function Overview

**Table 2-1** lists common functions of Config.

To better understand Config functions, you can learn **basic concepts** first.

**Table 2-1** Common functions

Category	Function	Description
Resource list	Querying all resources	You can view all resource information, including the resource name, region, service, resource type, and enterprise project, from the current account.
	Querying details about a resource	You can query resource details, such as the resource name, creation time, and specifications.
	Filtering resources	You can set a filter criterion (resource name, resource ID, tag, or enterprise project) to quickly find out specific resources.
	Exporting resource information	You can export the information about required resources in an EXCEL file.
	Viewing resource compliance data	You can view compliance data of a resource.
	Viewing relationships of a resource	You can view relationships of a resource.
	Viewing change records of a resource	You can view change records of a resource.

Category	Function	Description
Resource compliance	Adding a rule	You can use rules to evaluate resource compliance. You can select a custom or predefined policy and configure other related parameters when creating a rule.
	Evaluating resource compliance	You can click <b>Evaluate</b> in the <b>Operation</b> column to start the evaluation.
	Disabling a rule	You click <b>Disable</b> in the <b>Operation</b> column to disable a rule.
	Enabling a rule	If you want to use a disabled rule, you can enable it.
	Modifying a rule	If a rule does not meet your needs, you can change its configurations as needed.
	Deleting a rule	You can delete a rule which is no longer needed.
	Noncompliant resources	You can view and export information about all noncompliant resources.
	Organization rules	If you are an organization administrator or a delegated administrator of Config, you can add organization rules, and these rules will apply to all member accounts that are in the normal state in your organization.
	Remediation	You can remediate noncompliant resources to ensure compliance. You can use both managed and custom remediation actions.
Resource recorder	Enabling the resource recorder	You can track resource changes only after the resource recorder is enabled.
	Configuring the resource recorder	You can set the monitoring scope, select an SMN topic, and configure the data storage path (OBS bucket). Then you need to grant permissions to the resource recorder for using SMN to send notifications and storing resource snapshots in the OBS bucket.
	Modifying the resource recorder	You can modify resource recorder configurations, such as the monitoring scope, resource dump, data retention period, SMN topic, and permissions.
	Disabling the resource recorder	You can disable the resource recorder at any time.



Category	Function	Description
Advanced Queries	Running an advanced query	You can use ResourceQL to query current configurations of your resources.
	Creating a query	You can add custom queries, so that you can directly run them later.
	Viewing a query	You can view the name, description, and SQL statement of a query.
	Modifying a query	If a custom query cannot meet your requirements, you can modify its name, description, and query statement.
	Deleting a query	If a custom query is no longer needed, you can delete it.
Resource Aggregation	Creating a resource aggregator	You can use resource aggregators to aggregate resource configurations and compliance data from multiple accounts or an organization.
	Viewing resource aggregators	You can view created resource aggregators and their details.
	Editing a resource aggregator	You can edit source accounts in a resource aggregator.
	Deleting a resource aggregator	If a resource aggregator is no longer used, you can delete it.
	Viewing aggregated rules	You can view all aggregated rules and their conformance data.
	Viewing aggregated resources	You can view all resources aggregated by the resource aggregator.
	Authorizing an aggregator account	An aggregator account needs authorization from source accounts to collect resource configuration and compliance data from these accounts
	Applying advanced queries to aggregators	Resource aggregation supports advanced queries. You can use ResourceQL to query configuration states of resources from one or more source accounts.
Conformance package	Creating conformance packages	You can use example or custom templates to create and manage rules.

Category	Function	Description
	Viewing conformance packages	You can view the conformance package list and details of each conformance package.
	Deleting conformance packages	You can delete conformance packages as needed. Rules included in a conformance package will be deleted automatically if the conformance package is deleted.
	Organization conformance packages	If you are an organization administrator or a delegated administrator of Config, you can add organization conformance packages and deploy these packages to all member accounts that are in the normal state in your organization.
CTS	Supported CTS operations	CTS records operations on Config for later query, audit, and backtrack.
	Viewing tracing logs	You can view or export Config operation records of the last seven days on CTS console.

# 3 Billing

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The SMN topic and the OBS bucket that you configured for the resource recorder will be charged. For details, see [SMN billing](#) and [OBS billing](#) for OBS.

The Function Graph functions used for creating custom rules will be charged. For details, see [FunctionGraph Billing Overview](#).

The Resource Formation Service (RFS) private templates and FunctionGraph functions used for applying remediation actions on noncompliant resources will be charged. For details, see [FunctionGraph Billing Overview](#). RFS is free of charge. However, if there are paid resources created for adding an RFS private template, you will be billed for the resources. For details, see the billing description of the corresponding service.

After Config is put into commercial use, you will be charged based on the number of times that the resource recorder records your resource changes and that a rule is executed.

Config will continue to be free for 2024. If it is billed later, we will notify you in advance.

# 4 Permissions

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If you need to assign different permissions to employees in your enterprise, 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 flexibly manage resource access.

You can create users using IAM and grant users permissions to implement access control. For example, if you want some of your employees to have the permissions for configuring the resource recorder, you can create IAM users for them and grant them with the required permissions.

If your Huawei Cloudaccount does not need individual IAM users for permissions management, skip this chapter.

IAM can be used free of charge. You pay only for the resources in your account. For more details, see [What is IAM?](#)

## Config Permissions

By default, new IAM users do not have permissions. You need to add a user to one or more groups and attach policies or roles to the user groups. Users in a group inherit permissions from the group, so that they can perform operations on cloud services based on the permissions.

Config is a global service. You do not need to repeat Config authorization for different regions or switch regions for accessing Config.

A user with Config read-only permissions can view all resources on the **Resource List** page.

You can grant permissions by using roles or policies.

- **Roles:** A coarse-grained authorization strategy that defines permissions by job responsibility. Only a limited number of service-level roles are available for authorization. When using roles to grant permissions, you must also assign other roles which the permissions depend on to take effect. However, roles are not an ideal choice for fine-grained authorization and secure access control.
- **Policy:** A type of fine-grained authorization method that defines permissions required to perform operations on specific cloud resources under certain conditions. Authorization using policies is more flexible and help you

implement least privilege. Most policies define permissions based on APIs. API actions are the minimum granularity of permissions. For API actions supported by Config, see the **Permissions Policies and Supported Actions** section in *Config API Reference*.

**Table 1 Config system-defined permissions** lists all the system-defined permissions supported by Config.

**Table 4-1** Config system-defined permissions

Policy	Description	Dependencies
RMS ConsoleFullAccess	Grants full access to Config console. This policy grants you the permissions to perform all actions on the resource list, resource recorder, resource compliance, advanced queries, aggregators, and conformance packages.	RF FullAccess
RMS FullAccess	Grants full access to Config. This policy grants you the permissions to perform all actions on the resource list, resource recorder, resource compliance, advanced queries, aggregators, and conformance packages.	RF FullAccess
RMS ReadOnlyAccess	Grants read-only access to Config. This policy grants you read access to the resource list, resource recorder, resource compliance, advanced queries, aggregators, and conformance packages.	None

 **NOTE**

An IAM user or IAM Identity Center user may still be denied specific operations on resource recorders, rules, or conformance packages even if they have been granted the **RMS ConsoleFullAccess** permission. This is because specific operations require IAM agencies. To perform these operations, you need related IAM agencies. The following lists the details.

To create IAM agencies, you need the **iam:agencies:createAgency** and **iam:permissions:grantRoleToAgency** permissions. To grant the permission **iam:permissions:grantRoleToAgency**, specific actions need to be specified.

**Table 4-2** lists the common operations and the system-defined permissions of Config. ✓ indicates that an operation is supported, and × indicates not supported.

**Table 4-2** Common operations supported by system-defined permissions

Operation	RMS ConsoleFullAccess	RMS FullAccess	RMS ReadOnlyAccess
Querying all resources	√	√	√
Query details about a resource.	√	√	√
Filtering resources	√	√	√
Exporting resources	√	√	√
Viewing resource compliance data	√	√	√
Viewing relationships of a resource	√	√	√
Viewing resource change history	√	√	√
Querying the resource recorder	√	√	√
Enabling, configuring, or modifying the resource recorder	√	√	x
Disabling the resource recorder	√	√	x
Querying a compliance policy	√	√	√
Modifying rules	√	√	x
Adding rules	√	√	x
Querying rules	√	√	√
Deleting rules	√	√	x
Creating organization rules	√	√	x
Modifying organization rules	√	√	x
Viewing organization rules	√	√	√

Operation	RMS ConsoleFullAccess	RMS FullAccess	RMS ReadOnlyAccess
Deleting organization rules	√	√	x
Viewing resource compliance evaluation results	√	√	√
Triggering a resource compliance evaluation	√	√	x
Updating compliance evaluation results	√	√	x
Creating remediation configurations	√	√	x
Viewing remediation configurations	√	√	√
Modifying remediation configurations	√	√	x
Deleting remediation configurations	√	√	x
Viewing remediation execution status	√	√	√
Applying remediation actions	√	√	x
Adding remediation exceptions	√	√	x
Deleting remediation exceptions	√	√	x
Viewing remediation exceptions	√	√	√

Operation	RMS ConsoleFullAccess	RMS FullAccess	RMS ReadOnlyAccess
Running advanced queries	√	√	x
Creating advanced queries	√	√	x
Querying advanced queries	√	√	√
Listing advanced queries	√	√	√
Updating advanced queries	√	√	x
Deleting advanced queries	√	√	x
Creating a resource aggregator	√	√	x
Viewing a resource aggregator	√	√	√
Modifying a resource aggregator	√	√	x
Deleting a resource aggregator	√	√	x
Viewing aggregated rules	√	√	√
Viewing aggregated resources	√	√	√
Authorizing a resource aggregator account	√	√	x
Deleting authorization for an aggregator account	√	√	x



Operation	RMS ConsoleFullAccess	RMS FullAccess	RMS ReadOnlyAccess
Deleting resource aggregation requests	√	√	x
Viewing resource aggregation requests	√	√	√
Running advanced queries to aggregators	√	√	x
Viewing an authorization list	√	√	√
Creating conformance packages	√ (depends on RF FullAccess)	√ (depends on RF FullAccess)	x
Viewing conformance packages	√	√	√
Listing conformance packages	√	√	√
Deleting conformance packages	√ (depends on RF FullAccess)	√ (depends on RF FullAccess)	x
Updating conformance packages	√ (depends on RF FullAccess)	√ (depends on RF FullAccess)	x
Listing conformance package sample templates	√	√	√
Creating organization conformance packages	√	√	x
Viewing organization conformance packages	√	√	√

Operation	RMS ConsoleFullAccess	RMS FullAccess	RMS ReadOnlyAccess
Listing organization conformance packages	√	√	√
Deleting organization conformance packages	√	√	x
Updating organization conformance packages	√	√	x

# 5 Basic Concepts

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## Resource

A resource is an entity that you can use on the cloud platform. A resource can be an Elastic Cloud Server (ECS), an Elastic Volume Service (EVS) disk, or a Virtual Private Cloud (VPC).

For details about supported resources and regions, see [Services and Regions Supported by Config](#).

## Resource Relationship

Resource relationships indicate how your cloud resources are associated. For example, a resource relationship can be described as an EVS disk attached to a cloud server or a cloud server deployed in a VPC.

For details, see [Relationships with Supported Resources](#).

## Resource Change Records

Resource change records contain resource changes in a specific period of time.

A record will be generated if there is a change to resource relationships or attributes.

Resource attributes are key and value pairs that describe the characteristics of your resources. For example, a resource attribute can be the number of CPU cores of an ECS, the capacity of an EVS disk, or the password strength of an IAM user. For more details, see [How Can I Obtain Resource Attributes Reported to Config?](#)

## Resource Recorder

The resource recorder tracks changes to your cloud resources that are supported by Config. What changes are tracked depends on what a service reports to Config.

If you have enabled the resource recorder and specified an OBS bucket and an SMN topic when you configure the resource recorder, Config will notify you if there is a change (creation, modification, deletion, relationship change) to the resources within the monitoring scope and periodically store your notifications and resource snapshots.

## Resource Compliance

You can create rules to evaluate the compliance of your resources. You can view and export information of your noncompliant resources.

## Advanced Query

The advanced query allows you to quickly query specific resources, helping you obtain resource details, analyze resources from multiple perspectives, and quickly export data reports.

## Resource Aggregator

A resource aggregator enables you to aggregate resource configurations and compliance data from multiple accounts or an organization, so that you can centrally view or search for resource data.

## Conformance Package

A conformance package is a collection of rules. Conformance packages allow you to centrally create and manage rules for compliance data query.

# 6 Relationships with Other Services

The following describes the relationships between Config and other services.

**Table 6-1** Relationships between Config and other services

Service	Description	Function	Related Operation
SMN	<p>You can specify an SMN topic when you enable the resource recorder.</p> <p><b>NOTE</b> If you have configured an OBS bucket and you do not need notifications for resource changes, you do not need to configure an SMN topic.</p>	You will receive a notification if a change is made to your resource.	<a href="#">Configuring the Resource Recorder</a>
OBS	<p>You can specify an OBS bucket when you enable the resource recorder.</p> <p><b>NOTE</b> If you have configured an SMN topic and you do not need an OBS bucket for resource dump, you do not need to configure an OBS bucket.</p>	If you have configured an SMN topic and an OBS bucket, the resource recorder stores resource change notifications into the specified OBS bucket every 6 hours.	<a href="#">Configuring the Resource Recorder</a>
		The resource recorder stores your resource snapshots into the specified OBS bucket every 24 hours.	

Service	Description	Function	Related Operation
IAM	You need to assign Config related permissions when you configure the resource recorder.	The <b>Quick granting</b> mode grants Config the permissions to send resource change notifications with an SMN topic and store data into an OBS bucket. For more refined permission control, use custom authorization.	<a href="#">Configuring the Resource Recorder</a>
	When creating a conformance package, you can use IAM for custom authorization.	If you decide to not use custom authorization when creating a conformance package, Config will be automatically assigned an agency that contains required RFS permissions. You can also create a custom agency with IAM. The agency must contain required permissions for RFS to create, modify, and delete rules in a conformance package.	<a href="#">Creating a Conformance Package</a>
	You can use IAM to control user access to Config.	You can assign users system-defined or custom policies through IAM to decide which operations they can perform on Config.	<a href="#">Permissions</a>
CTS	CTS records operations on Config.	CTS helps you record operations on Config for later query, audit, and backtrack.	<a href="#">Recording Config Operations in CTS</a>

Service	Description	Function	Related Operation
FunctionGraph	You can use FunctionGraph to create a custom policy to evaluate resource compliance.	To create a custom rule, you need to use FunctionGraph. Each custom rule is associated with a Function Graph function. Config reports events to the function. The function collects rule parameters and resource attributes from the events; evaluates whether your resources comply with the rule; and returns evaluation results using Open APIs of Config.	<a href="#">Adding a Custom Rule</a>
	You can use a FunctionGraph function to remediate noncompliant resources.	Each remediation configuration of a rule can be associated with a FunctionGraph function. The function contains the logic for remediating noncompliant resources.	-
Resource Formation Service (RFS)	To create, update, and delete rules in a conformance package, an RFS resource stack is required.	A conformance package is a collection of rules. The rules in a conformance package are created, updated, and deleted through an RFS resource stack.	<a href="#">Conformance Packages</a>
	You can use an RFS private template to remediate noncompliant resources.	Each remediation configuration of a rule can be associated with an RFS private template. The template contains the logic for remediating noncompliant resources.	-
Resource Access Manager (RAM)	When adding a custom organization rule, you need to share your FunctionGraph functions with your organization members through RAM.	A custom policy of a rule is a function developed and published with FunctionGraph. When deploying a custom rule across an organization, you need to share the function with the organization members through RAM.	<a href="#">Creating a Custom Organization Rule</a>

Service	Description	Function	Related Operation
Organizations	An organization administrator or a delegated Config administrator can create rules, conformance packages, and resource aggregators in a unified manner and deploy them to all member accounts that are in the normal state in the organization.	After Config is enabled as a trusted service through Organizations, it is able to access the information about organization units and members and use related capabilities at an organization level.	<ul style="list-style-type: none"> <li>• <a href="#">Organization Rules</a></li> <li>• <a href="#">Organization Conformance Packages</a></li> <li>• <a href="#">Resource Aggregation</a></li> </ul>
Cloud Eye	Certain Config events can be reported to and related alarm rules can be configured with Cloud Eye for service monitoring.	Cloud Eye can provide data about operations on Config. Related alarms can also be configured.	<a href="#">Event Monitoring</a>



# 7 Constraints and Limitations

The constraints on Config are as follows:

**Table 7-1** Constraints and limitations on Config

Description	Limit
Resource data synchronization period <b>NOTE</b> There is a delay in synchronizing resource data to Config. The delay varies depending on services.  If the resource recorder is enabled, Config will update related data for resources that are included in the monitoring scope within 24 hours. If the resource recorder is disabled, Config will not update resource data.	24 hours
Retention duration of resource snapshots	24 hours
Retention duration of resource change notifications	6 hours
Maximum number of times the resource recorder can be enabled and modified per day	10
Maximum number of rules (including organization rules and rules included in a conformance package) that can be added in an account	500
Maximum number of conformance packages (including organization conformance packages) in an account	50
Maximum number of resource aggregators (account specific) in an account	30

Description	Limit
Maximum number of accounts a resource aggregator can collect.	30
Maximum number of accounts can be added, updated, or deleted in an account every seven days	1,000
Maximum number of resource aggregators (organization specific) in an account	1
Maximum number of times you can create resource aggregators (organization specific) for an account per day	One time
Maximum number of advanced queries in an account	200
Number of results returned for each advanced query	4,000
The default retention period for resource configurations	7 years (2,557 days)

**NOTICE**

To get full functionality of Config, you need to enable the resource recorder. If the resource recorder is disabled, you may fail to update your resource data, create and use rules, or to aggregate resource data. For details about how to enable and configure the resource recorder, see [Configuring the Resource Recorder](#).