Cloud Firewall

Service Overview

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What Is CFW?

Cloud Firewall (CFW) is a next-generation cloud-native firewall. It protects Internet and VPC borders on the cloud by real-time intrusion detection and prevention, global unified access control, full traffic analysis, log audit, and tracing. It employs AI for intelligent defense, and can be elastically scaled to meet changing business needs, helping you easily handle security threats. CFW is a basic service that provides network security protection for user services on the cloud.

Intelligent Defense

CFW has integrated Huawei Cloud/security capabilities and Huawei network threat intelligence. Its AI intrusion prevention engine can detect and block malicious traffic in real time. It works with other security services globally to defend against Trojans, worms, injection attacks, vulnerabilities, phishing, and brute-force attacks.

High Scalability

CFW can implement refined control on all traffic, including Internet border, cross-VPC, and cross-ECS traffic, to prevent external intrusions, internal penetration attacks, and unauthorized access from internal to external networks. Its bandwidth, number of EIPs, and number of security policies can be increased without limit. Its cluster is deployed in HA mode to protect your workloads under heavy traffic.

Easy-to-Use Application

As a cloud-native firewall, CFW can be enabled easily, import multi-engine security policies with a few clicks, automatically check assets within seconds, and provide a UI for performing operations, greatly improving management and defense efficiency.

Supported Access Control Policies

- Access control based on the 5-tuple (source IP address, source port, destination IP address, destination port, and protocol)
- Access control based on the domain name

- Access control based on the intrusion prevention system (IPS). The IPS works in observation or block mode. In block mode, CFW detects and blocks traffic that matches the IPS rules.
- ACL access control policies set for IP address groups, blacklists, and whitelists

2_{Features}

CFW provides the standard and professional editions. You can use access control, intrusion prevention, traffic analysis, and log audit functions on the console.

 Table 2-1 Features

ltem	Description	
Dashboa rd	You can check basic information about firewall instances, resource protection, and more statistics.	
Assets	You can check and manage EIPs.	
Access Control	You can control traffic at Internet and VPC borders based on IP addresses, regions, and domain names.	

ltem	Description		
Intrusion Preventi	• Protection Mode : Check and block Internet traffic to detect and prevent intrusion.		
on	• Basic Protection : It provides threat detection and vulnerability scan based on the built-in IPS rule library.		
	 It checks whether traffic contains phishing, Trojans, worms, hacker tools, spyware, password attacks, vulnerability attacks, SQL injection attacks, XSS attacks, and web attacks. 		
	 It checks whether there are protocol anomalies, buffer overflow, access control, suspicious DNS activities, and other suspicious behaviors in traffic. 		
	NOTE		
	 In the basic protection (IPS) rule library, you can manually modify protection actions. 		
	 You can query rule information by rule ID, signature name, risk level, update time, CVE ID, attack type, rule group, and current action in the basic protection (IPS) rule library. 		
	• Virtual Patching : Hot patches are provided for IPS at the network layer to intercept high-risk remote attacks in real time and prevent service interruption during vulnerability fixing.		
	• Custom IPS signature : You can customize IPS signature rules. CFW will detect threats in data traffic based on signatures.		
	NOTE HTTP, TCP, UDP, POP3, SMTP and FTP protocols can be configured in user- defined IPS signatures.		
	• Sensitive Directory Scan Defense: Defend against scan attacks on sensitive directories on your servers.		
	Reverse Shell Defense: Defend against reverse shells.		
Antivirus	The anti-virus function identifies and processes virus files through virus feature detection to prevent data damage, permission change, and system breakdown caused by virus files.		
	The antivirus function can check access via HTTP, SMTP, POP3, FTP, IMAP4, and SMB.		
Traffic	The following traffic statistics are displayed:		
Analysis	 Inbound Traffic: traffic from the Internet to ECSs 		
	• Outbound Traffic: statistics on the traffic generated when cloud servers proactively access the Internet		
	• Inter-VPC access: inbound and outbound traffic statistics between VPCs		

ltem	Description			
Log	You can check the following types of logs:			
Audit	Attack event logs, which contain details about intrusions			
	 Access control logs, which contain details about what access is allowed and what is blocked 			
	• Traffic logs, which contain the access traffic of specific services			
	You can use Log Tank Service (LTS) on Huawei Cloud to record all CFW logs, including attack event, access control, and traffic logs.			
System Manage ment	 Alarm notification: You can use CFW to set notifications for attack logs and traffic threshold-crossing warnings. After the alarm notification function is enabled, IPS attack logs and traffic threshold-crossing warnings will be sent through emails or SMS messages. Network packet capture: You can capture network packets to 			
	locate network faults and attacks.			

Table 2-2 Engine

Engi ne	Function	Protocol	Scenario
Firew all engin e	The load balancing component distributes user traffic to the tenant firewall engine for security check and protection, and then sends the traffic to the target ECS. This engine provides various detection functions and flexible blocking policies.	TCP, UDP, ICMP, and Any	Protection for Internet and VPC borders

3_{Editions}

CFW provides the standard and professional editions. You can use access control, intrusion prevention, traffic analysis, and log audit functions on the console.

For details about their functions, see **Features**.

For details about the differences, see **Table 3-1**.

Description:

- $\sqrt{}$: The function is included in the current edition.
- x: The function is not included in the current edition.

Table 3-1 Editions

Feature		Standard	Professional
Protection	Protected EIPs at Internet boundary	20 (expandable)	50 (expandable)
	Peak protection traffic at Internet boundary	10 Mbit/s (expandable)	50 Mbit/s (expandable)
Protected VPCs		×	2 (expandable)
	Max. peak protection traffic between VPCs	×	200 Mbit/s (can be increased with the number of VPCs)
Access traffic control	ACL access control for public network assets (based on IP addresses, domain names, domain groups, and geographical locations)	\checkmark	\checkmark

Feature		Standard	Professional
North-south traffic protection and cloud resource (including EIP) protection against risks on the Internet		\checkmark	\checkmark
	North-south traffic audit and attack log query	\checkmark	\checkmark
	East-west traffic protection, asset protection between VPCs, and full traffic analysis	×	\checkmark
	East-west traffic monitoring to obtain inter-VPC traffic data in real time	×	\checkmark
Protection policies	Intrusion prevention system (IPS)	\checkmark	\checkmark
	Custom IPS signature database	×	\checkmark
	Sensitive directories and reverse shells	√	\checkmark
	Antivirus	×	\checkmark

4 Application Scenarios

External Intrusion Prevention

You can use CFW to perform security stocktaking on service assets accessible to the public network and enable intrusion detection and prevention in one click.

Control Over Server Originated Traffic

Implement domain-based precise control over server originated traffic.

Inter-VPC Access Control (Available in Professional Edition)

Check inter-VPC traffic and control internal access.

5 Constraints and Limitations

Constraints and Limitations describes the overall constraints of CFW. **Function Constraints and Limitations** describes the constraints of each function. For details about the differences between editions, see **Editions**.

Constraints and Limitations

- The CFW ALG tag function is restricted.
- By default, the network-layer defense against DDoS attacks and IP spoofing is disabled on CFW.
- Domain name protection depends on the DNS server you configure. The IP address of a default server may be incorrectly resolved. You are advised to use a custom server.
- To use CFW persistent connections, enable a bidirectional out-of-path policy. If you only enable a unidirectional policy, the client will need to re-initiate connections in certain scenarios, such as enabling or disabling protection, and expanding engine capacities. You can also **create a service ticket** to evaluate the risks of related issues.
- The maximum bandwidth of a **pay-per-use** firewall (total traffic that can pass through the firewall) is 1 Gbit/s.

Function Constraints and Limitations

Function	Constraint and Limitation
HUAWEI Ads Account Registration Place	CFW can be used in the selected region only. To use CFW in another region, switch to the corresponding region and then purchase it. For details about the regions where CFW can be purchased, see Function Overview .

Table 5-1 Function constraints and limitations of CFW

Function	Constraint and Limitation	
Protection rules	Up to 20,000 protection rules can be added.	
	 A single protection rule can be associated with a maximum of five service groups. 	
	• Each protection rule can be associated with up to two IP address groups.	
	Domain names in Chinese are not supported.	
	 Predefined address groups can be configured only for the source addresses in inbound rules (whose Direction is set to Inbound). 	
	• If NAT 64 protection is enabled and IPv6 access is used, allow traffic from the 192.19.0.0/16 CIDR block to pass through. NAT64 will translate source IP addresses into the CIDR block 198.19.0.0/16 for ACL access control.	
Blacklist and whitelist	• Up to 2000 items can be added to the blacklist.	
parameters	• Up to 2000 items can be added to the whitelist.	
IP address groups	 An IP address group can contain up to 640 IP addresses. 	
	 A firewall instance can contain up to 3800 IP address groups. 	
	• A firewall instance can contain up to 30,000 IP addresses.	
Service groups	• A service group can have up to 64 services.	
	• A firewall instance can have up to 512 service groups.	
	• A firewall instance can have up to 900 services.	

Function	Constraint and Limitation
Domain name groups	 Domain names in Chinese cannot be added to domain name groups. The domain names in a domain name group can be referenced by protection rules for up to 40,000 times, and wildcard domain names can be referenced for up to 2,000 times.
	URL Filtering (Layer 7 Protocol Parsing)
	 A domain name group can have up to 1,500 domain names.
	 A firewall instance can have up to 500 domain name groups.
	 A firewall instance can have up to 2,500 domain names.
	Address Resolution (Layer 4 Protocol Parsing)
	 A domain name group can have up to 15 domain names.
	 Each domain name can resolve up to 1000 IP addresses.
	 Each domain name group can resolve up to 1,500 IP addresses.
	• A firewall instance can have up to 1000 domain names.
Changing the action of a basic protection	 The action of a manually modified rule remains unchanged even if Protection Mode is changed.
rule	• The constraints on manually modified actions are as follows:
	 The actions of up to 3000 rules can be manually changed to observation.
	 The actions of up to 3000 rules can be manually changed to interception.
	 The actions of up to 128 rules can be manually changed to disabling.
Customizing IPS signatures	 Only the professional edition supports custom IPS signatures.
-	• A maximum of 500 features can be added.
	 Custom IPS signatures are not affected by the change of the basic protection mode.
	• Content can be set to URI only if Direction is set to Client to server and Protocol Type is set to HTTP.
Querying logs	• Logs can be stored for up to seven days.
	• Up to 100,000 records can be exported for a single log.

Function	Constraint and Limitation	
Network packet capture	 Only one packet capture task can be executed at a time. 	
	 Up to 20 packet capture tasks can be created every day. 	
	• Up to 1 million packets can be captured.	
Configuring DNS resolution	A maximum of two DNS servers can be customized.	

6 Billing

CFW can be billed in yearly/monthly (prepaid) or pay-per-usemode. For details, see **Pricing**.

Billing Items

CFW (yearly/monthly) is billed based on the edition, service duration, and specifications you purchase. If you select the pay-per-use billing mode, you will be charged based on the actual protection status.

Edition	Billing Mode	Billing Item	Billing
Standar d	Yearly/ Monthly	Required Duration	Billed on a yearly or monthly basis
		(Optional) Protected EIPs	Billed based on the purchased quantity
		(Optional) Peak Protection Traffic at Internet Boundary	Billed based on the purchased traffic
Professi onal	Pay-per- use	Usage duration	Billed for what you use

Billing Mode

- Yearly/Monthly: The longer the subscription duration, the lower the price. In yearly/monthly mode, you are billed based on the purchase period specified in the order.
- Pay-per-use: You are charged from the time when CFW is enabled to the time when CFW is disabled. If you enable the pay-per-use billing mode, you are

billed for the number of protected IP addresses, peak traffic, and number of VPCs.

Renewal

- After your yearly/monthly edition expires, there is a retention period for you. This period varies depending on your account. For details, see **Retention Period**.
- You can go to the management console to renew your subscription. For details, see **Renewal Management**.

7 Concepts Related to CFW

5-tuple

A 5-tuple (or quintuple) consists of a source IP address, a destination IP address, a protocol, a source port, and a destination port.

Internet Border Firewall

An Internet border firewall is a cluster firewall used to detect north-south traffic. It supports intrusion detection and prevention (IPS) and network antivirus based on EIPs.

VPC Border Firewall

A VPC border firewall is a distributed firewall used to detect communication traffic between two VPCs (east-west traffic), visualizing and protecting internal access activities.

IPS

An intrusion prevention system (IPS) is located between a firewall and a network device. It blocks attacks from suspicious communications before they are spread to other network devices.

Antivirus

The anti-virus function identifies and processes virus files through virus feature detection to prevent data damage, permission change, and system breakdown.

Internet Access

Internet access refers to the access from Internet IP addresses to cloud servers. Internet access protection helps you defend against intrusions from the outside in a timely manner.

Server Originated Access

Server originated access refers to the behavior that a cloud server proactively accesses an external IP address. Server originated access protection helps you manage and control outbound access behaviors.

VPC Peering Connection

A VPC peering connection is a networking connection between two VPCs It enables you to route traffic between them using private IP addresses. In the same resource pool, you can create a VPC peering connection between your own VPCs, or with a VPC of another tenant. However, you cannot create a VPC peering connection between VPCs in different resource pools.

CFW-associated Subnet

This is a parameter that can be configured for a VPC border firewall. After a CIDR block is configured, a CFW-associated subnet is automatically allocated to forward traffic from the firewall to an enterprise router.

Inspection VPC

An inspection VPC is used for a VPC border firewall to divert traffic. After a CIDR block is configured, CFW creates an inspection VPC by default to divert traffic from a service VPC to the firewall in VPC mode.

8 Permissions Management

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

With IAM, you can use your Huawei Cloud account to create IAM users for your employees, and assign permissions to the users to control their access to specific resource types. For example, if you have software developers and you want to assign them the permission to access CFW but not to delete CFW or its resources, then you can create an IAM policy to assign the developers the permission to access CFW but prevent them from deleting CFW related data.

If your Huawei Cloud account does not require individual IAM users for permissions management, skip this section.

IAM is free. You pay only for the resources in your account. For more information about IAM, see **IAM Service Overview**.

CFW Permissions

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

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

You can grant users permissions by using roles and policies.

• Roles: a type of coarse-grained authorization mechanism that defines servicelevel permissions based on user responsibilities. There are only a limited number of roles for granting permissions to users. If one role has a dependency role required for accessing CFW, assign both roles to the users. Roles are not an ideal choice for fine-grained authorization and secure access control.

• Policies: Policy-based permission management is a type of fine-grained authorization mechanism that grants permissions to perform operations on specific cloud resources. This mechanism allows for more flexible policy-based authorization and secure access control. For example, you can grant HSS users only the permissions for managing a certain type of resources.

Table 8-1 describes the system roles of CFW.

Role Name	Description	Category	Dependency
CFW FullAccess	Full permissions for CFW	System- defined policy	None
CFW ReadOnlyAccess	Read-only permissions for CFW	System- defined policy	None

Table 8-1 System policies supported by CFW

CFW FullAccess Policy Content



CFW ReadOnlyAccess Policy Content

{

}

```
"Version": "1.1",
"Statement": [
   {
      "Action": [
"cfw:*:list",
          "cfw:*:get",
          "vpc:publicIps:list",
          "vpc:publicipTags:get",
          "vpc:vpcs:list",
"vpc:vpcs:get",
          "vpc:subnets:get",
"vpc:routeTables:list",
          "vpc:quotas:list",
          "er:instances:list",
          "er:attachments:list",
         "er:routeTables:list",
         "er:routeTables:list",
         "er:routes:list",
         "er:associations:list",
         "er:instances:get",
          "ecs:cloudServers:list",
          "ecs:availabilityZones:list",
          "smn:topic:list",
          "nat:natGateways:list",
          "lts:groups:list",
          "lts:topics:get",
          "dcaas:vgw:list",
          "eps:resources:list",
          "tms:predefineTags:list"
      1,
       "Effect": "Allow"
   }
]
```

9 Related Services

Identity and Access Management (IAM)

Identity and Access Management (IAM) provides the permission management function for CFW. Only users who have Tenant Administrator permissions can perform operations such as authorizing, managing, and detect cloud assets using CFW. To obtain the permissions, contact the users who have the Security Administrator permissions.

Cloud Trace Service (CTS)

Cloud Trace Service (CTS) generates traces to enable you to get a history of operations performed on CFW, allowing you to query, audit, and backtrack resource operation requests initiated from the management console as well as the responses to those requests.

CTS records operations related to CFW, facilitating your further queries, audits, and retrievals.

Log Tank Service (LTS)

Log Tank Service (LTS) collects log data from servers and cloud services. CFW can record attack event logs, access control logs, and traffic logs to LTS, enabling real-time, efficient, and secure log processing.

Simple Message Notification (SMN)

Simple Message Notification (SMN) provides the message notification function. After you enable notification on CFW, you will receive alarms based on the notification mode you configured if your resources are attacked or the protection traffic exceeds your quota.

Enterprise Management

You can manage multiple projects in an enterprise, separately settle their costs, and assign them to different personnel. A project can be started or stopped independently without affecting others. With **Enterprise Management**, you can easily manage your projects after creating an enterprise project for each of them.

CFW can be interconnected with Enterprise Management. You can manage CFW resources by enterprise project and grant different permissions to users.

Differences from WAF

CFW and WAF are two different products launched by Huawei Cloud to protect your Internet borders, VPC borders, and web services.

The following table describes the differences between CFW and WAF.

Table 9-1 Differences between CFW and WAF

lte m	CFW	WAF
Defi niti on	Cloud Firewall (CFW) is a next- generation cloud-native firewall. It protects Internet and VPC borders on the cloud by real-time intrusion detection and prevention, global unified access control, full traffic analysis, log audit, and tracing. It employs AI for intelligent defense, and can be elastically scaled to meet changing business needs, helping you easily handle security threats. CFW is a basic service that provides network security protection for user services on the cloud.	WAF keeps web services stable and secure. It examines all HTTP and HTTPS requests to detect and block the following attacks: Structured Query Language (SQL) injection, cross-site scripting (XSS), web shells, command and code injections, file inclusion, sensitive file access, third-party vulnerability exploits, Challenge Collapsar (CC) attacks, malicious crawlers, and cross-site request forgery (CSRF). For details about WAF, see What Is Web Application Firewall?
Prot ecti on	 EIP and VPC borders Basic protection against web attacks Defense against external intrusions and protection of proactive connections to external systems 	 WAF protects web applications on Huawei Cloud and other clouds and on- premises applications through domain names or IP addresses. Comprehensive protection against web attacks
Fea ture s	 Asset management and intrusion defense: It detects and defends against intrusions into cloud assets that are accessible over the Internet in real time. Access control: You can control access at Internet borders. Traffic Analysis and log audit: CFW controls, analyzes, and visualizes VPC traffic, audits logs, and traces traffic sources. 	WAF identifies and blocks a wide range of suspicious attacks, such as SQL injections, XSS attacks, web shell upload, command or code injections, file inclusion, unauthorized sensitive file access, third-party vulnerability exploits, CC attacks, malicious crawlers, and CSRF.

A Change History

Date	Description	
2024-01-10	This is the third official release.	
	Restrictions on IP address groups, service groups, and domain name groups in Constraints and Limitations .	
2023-11-30	This is the second official release. Added:	
	Constraints and Limitations	
	• Concepts Related to CFW : Added the concepts of Internet border firewall, intrusion prevention system (IPS), and antivirus.	
	• Related Services : Added descriptions about Cloud Trace Service (CTS), Simple Message Notification (SMN), and enterprise management.	
2022-12-30	This is the first official release.	