User Guide

FortiAppSec Cloud 24.4

TABLE OF CONTENTS

What's New

24.4.p1 released on January 9, 2024

Bug Fixes

This release fixes several bugs for improved stability and experience.

Overview

FortiAppSec Cloud provides an all-in-one dashboard for accessing the following four subservices:

- **Web Application Firewall (WAF)**

  Protects public cloud hosted web applications from the OWASP Top 10 risks, zero day threats, and other application layer attacks. It also integrates FortiDAST's web vulnerability scanner (WVS) in its Vulnerability Scan feature.
- **Advanced Bot Protection**

  Detects and protects against sophisticated bots that may be used to conduct malicious automated attacks on your online applications, such as data harvesting, credential stuffing, account take-over attempts, DDoS attacks, and other fraudulent activities.
- **Global Server Load Balancer (GSLB)**

  Allows you to deploy redundant resources around the globe that can be leveraged to keep your business online when a local area deployment experiences unexpected spikes or downtime.
- **Threat Analytics**

  Uses machine learning algorithms to identify attack patterns across your entire application assets and aggregate them into security incidents and assign severity. It helps separate real threats from informational alerts and false positives and help you focus on the threats that matter.

Getting Started

This section introduces how to onboard your applications and the basic setups of the network.

- License & Contract on page 10
- Onboarding on page 13

License & Contract

Where to get FortiAppSec Cloud contracts

There are two places to purchase FortiAppSec Cloud contracts

- **Fortinet:** Supports features like Web Application Firewall (WAF), bandwidth management, Dynamic Application Security Testing (DAST), Global Server Load Balancing (GSLB) QPS and health checks, Advanced Bot Protection (ABP), and Security Operations Center (SOC) services.
- **AWS/Azure/GCP Marketplace (Coming soon)** This will provide tailored subscriptions for AWS, Azure, and Google Cloud Platform.

If you are using a legacy FortiWeb Cloud/ FortiGSLB/ FortiABP contract, you will be required to transition fully to a FortiAppSec Cloud contract to continue service past its expiry date. For information on the transition, please refer to Contract Migration on page 398.

Standard and Premium plans

There are two tiers of FortiAppSec Cloud contracts:

- **Standard**: Focuses on core protections, including negative security model policies, default configurations such as signatures, request limits, and more.
- **Premium**: Includes all features of the Standard plan and adds advanced capabilities, such as machine learning for web/API/bot protection, Threat Analytics, and additional security enhancements.

Review plan feature differences here:

Feature Category	Standard	Premium
Web Application Protection		
Signature based Protection	✓	✓
IP Threat Intelligence	✓	✓

Feature Category	Standard	Premium
GEO-IP Intelligence	✓	✓
Custom Security Rules	✓	✓
HTTP Compliance	✓	✓
URL, Parameter and CORS Protection	✓	✓
Cookie Protection	✓	✓
Information Leakage	✓	✓
AV for File Uploads	✓	✓
Sandboxing for File Uploads		✓
Zero Day Attack Protection - Machine Learning based Anomaly Detection		✓
API Security		
Schema Enforcement (OpenAPI, XML, JSON)		✓
API Gateway		✓
Mobile API Protection		✓
Machine Learning based - Discovery, PII Catalog, Protection		✓
Client Security		
HTTP Header Protection	✓	✓
CSRF and MiTB Protection	✓	✓
Bot Defense		
Signature, Threshold, Biometric and Deception	✓	✓
Machine Learning based Bot Defense		✓
Advanced Bot Protection	Available Separately	Available Separately
Account Takeover		

Feature Category	Standard	Premium
User Tracking		✓
Session Fixation Protection		✓
Credential Stuffing Defense		✓
DDoS		
Layer 3-4 DDoS Mitigation	✓	✓
Layer 7 DDoS Mitigation	✓	✓
Application Delivery		
SSL Certificates - Automatic and Custom	✓	✓
Client Authentication / Mutual TLS		✓
Content Delivery Network (CDN)	✓	✓
Limited GEO CDN	✓	✓
Load Balancing and Server Health Monitoring	✓	✓
Origin Server Content Routing		✓
Waiting Room		✓
Global Server LB		
DNS Load Balancing	Available Separately	Available Separately
DNS Services + DNSSEC	Available Separately	Available Separately
Health Check (Synthetic Testing)	Available Separately	Available Separately
DAST Scanning		
Vulnerability Assessment	Available Separately	Available Separately
API Scanning	Available Separately	Available Separately
Reporting and Analytics		

Feature Category	Standard	Premium
Attack Logs	✓	✓
Alert Notifications	✓	✓
SIEM Integration	✓	✓
Log Sensitive Data Masking	✓	✓
FortiView - Realtime and historical log Analysis	✓	✓
Security and Network Dashboards and Reports	✓	✓
Traffic Logs		✓
Threat Analytics AI		✓
Management		
Role Based Access Control	✓	✓
Single-Sign-On Support		
API Support	✓	✓
Services		
24/7 Support	✓	✓
SOCaaS - log monitoring, incident triage and SOC escalation service	Available Separately	Available Separately

View Contract

To view your contract type for an active service, log into the FortiAppSec Cloud web portal and go to **General > Contracts**.

For details on what you can do on this page, please see Contracts on page 358

Onboarding

After purchasing your contract or license, add applications to FortiAppSec Cloud to access the security features of its services.

Add Application

To protect your domain, add your application separately to each service. You can do this by selecting **Add Application** next to each service widget on the **Home** dashboard or by navigating to the desired service through the side menu.

FortiAppSec Cloud currently does not support adding an application for multiple/all services in one process.

However, please note the following:

- the **WAF** and **Threat Analytics** services share an onboarding procedure.
- To use Advanced Bot Protection (ABP) with WAF, we recommend onboarding your application to WAF first. Once complete, add the ABP module for the application, as this will automatically register it with the Advanced Bot Protection service.

For detailed instructions, please see the onboarding details of each service:

- Onboarding WAF applications on page 19
- Onboarding GSLB Applications on page 248
- Onboard ABP Applications on page 224

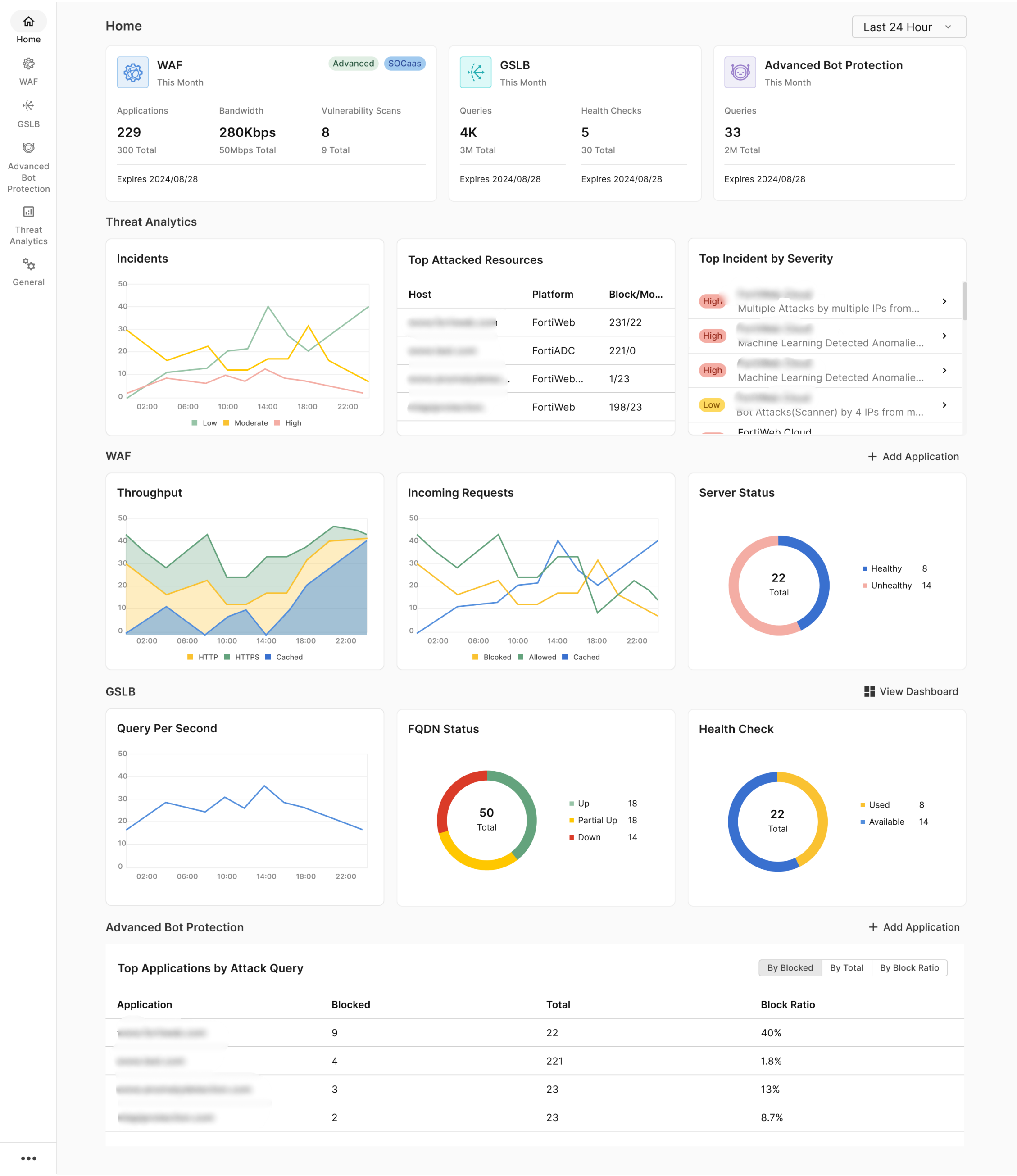
Many of the security features in the WAF and ABP services are specific to each application, and therefore must be accessed by selecting an application first. For details on the workflow for these services, please see the following pages:

- WAF Workflow and Dashboard Overview on page 41
- ABP Workflow and Dashboard Overview on page 195

Home

The Home page displays a summary of insights on your application activity from your various services.

- Understanding Insights on page 16
- Home on page 15



Home

WAF — This Month — Advanced — SOCaas

Applications	Bandwidth	Vulnerability Scans
229	280Kbps	8
300 Total	50Mbps Total	9 Total

Expires 2024/08/28

GSLB — This Month

Queries	Health Checks
4K	5
3M Total	30 Total
Expires 2024/08/28	Expires 2024/08/28

Advanced Bot Protection — This Month

Queries
33
2M Total

Expires 2024/08/28

Threat Analytics

Incidents

Top Attacked Resources

Host	Platform	Block/Mo...
[redacted]	FortiWeb	231/22
[redacted]	FortiADC	221/0
[redacted]	FortiWeb...	1/23
[redacted]	FortiWeb	198/23

Top Incident by Severity

- High — [redacted] — Multiple Attacks by multiple IPs from...
- High — [redacted] — Machine Learning Detected Anomalie...
- High — [redacted] — Machine Learning Detected Anomalie...
- Low — [redacted] — Bot Attacks(Scanner) by 4 IPs from m...
- FortiWeb Cloud

WAF — + Add Application

Throughput

Incoming Requests

Server Status

Healthy	8
Unhealthy	14

22 Total

GSLB — View Dashboard

Query Per Second

FQDN Status

Up	18
Partial Up	18
Down	14

50 Total

Health Check

Used	8
Available	14

22 Total

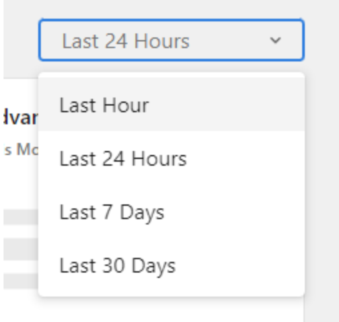
Advanced Bot Protection — + Add Application

Top Applications by Attack Query — By Blocked | By Total | By Block Ratio

Application	Blocked	Total	Block Ratio
[redacted]	9	22	40%
[redacted]	4	221	1.8%
[redacted]	3	23	13%
[redacted]	2	23	8.7%

Understanding Insights

Select a date range or time frame to view insights on the traffic activity of your application.



Widget	Description
Threat Analytics	
Incidents	A line graph displaying the number of attack events by severity level. For more information on incident severity levels and how they are determined, please see Incidents on page 328.
Top Attacked Resources	A ranked table containing the applications with the highest number of detected attack events, the service that detected the attack events, and the numbers of blocked and monitored events. **Blocked** events indicates that the detected malicious traffic is immediately stopped by FortiAppSec Cloud. **Monitored** events indicates the event is logged without any interruption to traffic. This is helpful for monitoring and evaluating threats without affecting user traffic.
Top Incident by Severity	A list of significant attack events, ranked by severity. Click on an event to view details.
WAF	
Throughput	A stacked line graph of throughput on all of your applications over the selected time span in bits/second.
Incoming Requests	A line graph of the number of incoming requests over the selected time span.
Server Status	A pie chart displaying the server status of your various applications.
GSLB	
Query Per Second	A line graph of the queries per second on applications in your account over the selected time frame.
FQDN Status	A pie chart showings the status of your FQDNs.
Health Check	A pie chart displaying the ratio of used and available Health Checks.
Advanced Bot Protection	

Widget	Description
Top Applications by Attack Query	This table displays counts for blocked and detected bot activities, as well as the block ratio, calculated from these two figures. To sort the table, click one of the following options: • **By Blocked**: Orders from the highest to lowest number of blocked transactions. • **By Total**: Orders from the highest to lowest total number of bot queries. • **By Block Ratio**: Orders from the highest to lowest block ratio. Please note, an **Attack Query** doesn’t always indicate a malicious bot attack. Instead, it refers queries exchanged between the FortiABP device and a FortiADC/FortiWeb device on the protected application.

WAF

FortiAppSec Cloud's WAF is a SaaS, cloud-based Web Application Firewall (WAF) designed to protect public cloud-hosted web applications from the OWASP Top 10, zero-day threats, and other application layer attacks.

With no hardware or software requirements, FortiAppSec Cloud utilizes a network of WAF gateways hosted in AWS, Azure, OCI, and Google Cloud regions. This architecture ensures that application traffic is scrubbed within the same region where your applications reside, addressing performance and regulatory concerns while minimizing traffic costs.

To begin securing your applications, refer to Onboarding WAF applications on page 19.

WAF setup

This section introduces how to onboard your applications and the basic setups of the network.

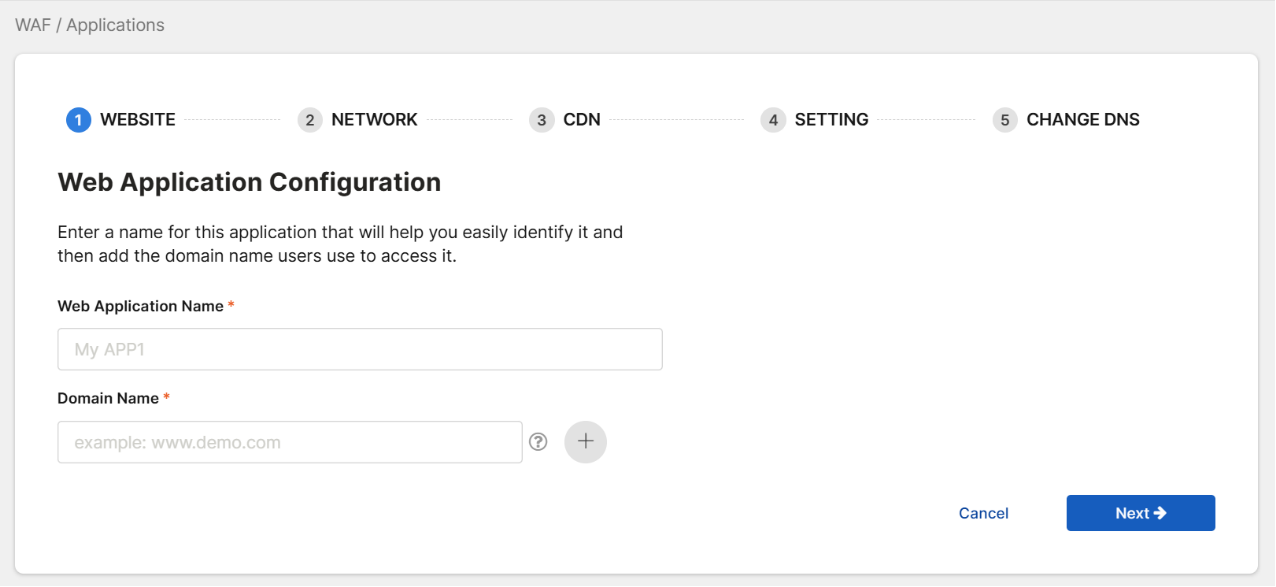
- Onboarding WAF applications
- Example: Changing DNS records on AWS Route 53
- Changing IP addresses of origin servers
- Restricting direct traffic & allowing FortiAppSec Cloud IP addresses
- Restricting direct traffic & allowing FortiAppSec Cloud IP addresses
- How does WAF choose regions?
- CDN
- Understanding block mode and action

Onboarding WAF applications

Configure FortiAppSec Cloud to protect your web applications by following these Onboarding steps.
To onboard applications by DevOps tools, see DevOps tools on page 152.

Onboarding steps

1. Add the following IPs to the allowlist on your application server's firewall to enable FortiAppSec Cloud services to reach your application.
   - 3.123.68.65
   - 3.226.2.163
2. Go to appsec.fortinet.com and log in with your FortiCloud account credentials.
3. Navigate to **WAF > Applications**
4. Click **Add Application** near the top right corner of the page. The **Web Application Configuration** wizard will open.
5. **Web Application Configuration**



WAF / Applications

1 WEBSITE — 2 NETWORK — 3 CDN — 4 SETTING — 5 CHANGE DNS

Web Application Configuration

Enter a name for this application that will help you easily identify it and then add the domain name users use to access it.

Web Application Name *

My APP1

Domain Name *

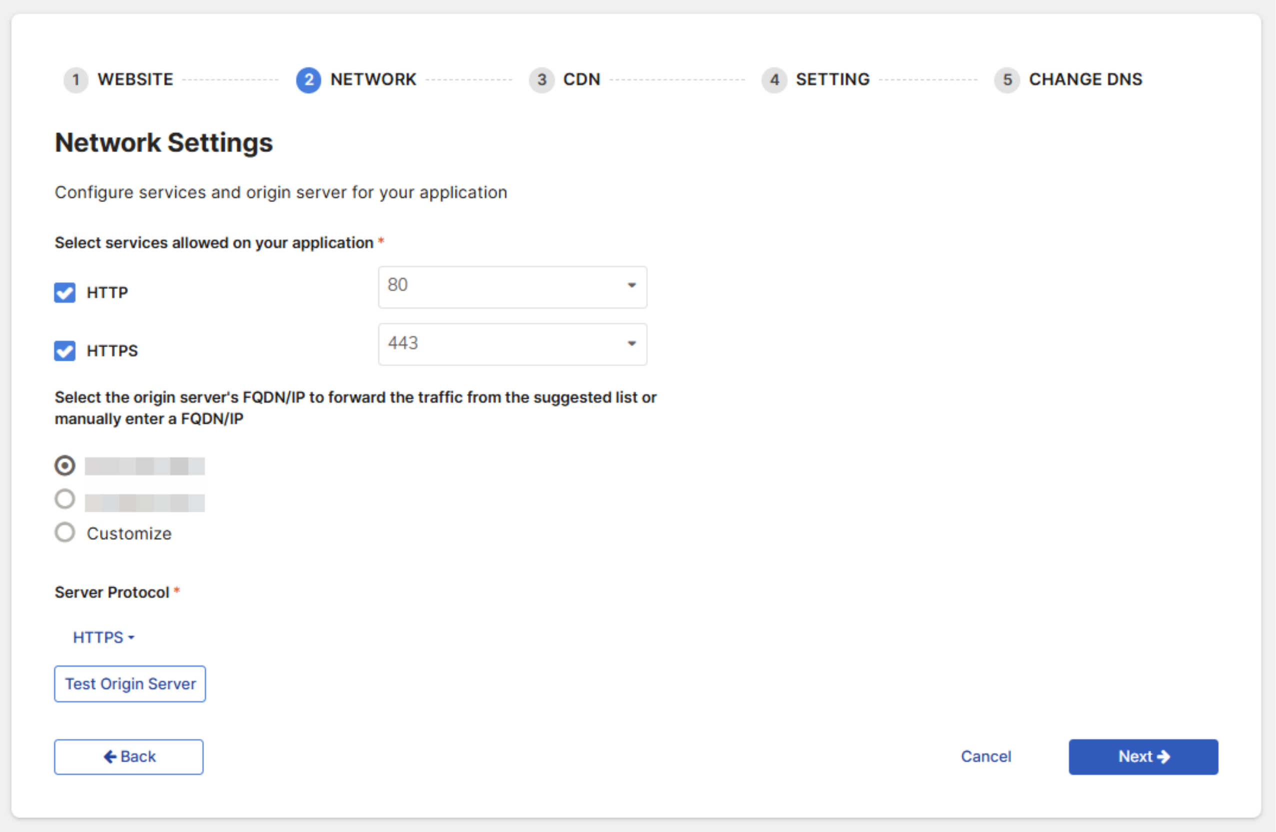
example: www.demo.com

   a. **Web Application Name:** Enter a name for this application that will make it easy for you to identify within the FortiAppSec Cloud UI.
   b. Wildcard entries are allowed for all domains in the list except the first one. Ensure that domain name entries don't overlap; for instance, you can't add both "www.example.com" and "*.example.com" together.

      Wildcards only match strings at the same domain level; for example, "a.example.com" matches "*.example.com," but "a.a.example.com" does not.

      You can later go to **Network > Endpoints** to change or add domains.
      If you have multiple applications with different root domain names but sharing the same IP address, it requires special configurations. See Multiple domains sharing the same IP address on page 168.

6. **Network Settings**



1 WEBSITE 2 NETWORK 3 CDN 4 SETTING 5 CHANGE DNS

Network Settings

Configure services and origin server for your application

Select services allowed on your application *

☑ HTTP 80

☑ HTTPS 443

Select the origin server's FQDN/IP to forward the traffic from the suggested list or manually enter a FQDN/IP

● [redacted]

○ [redacted]

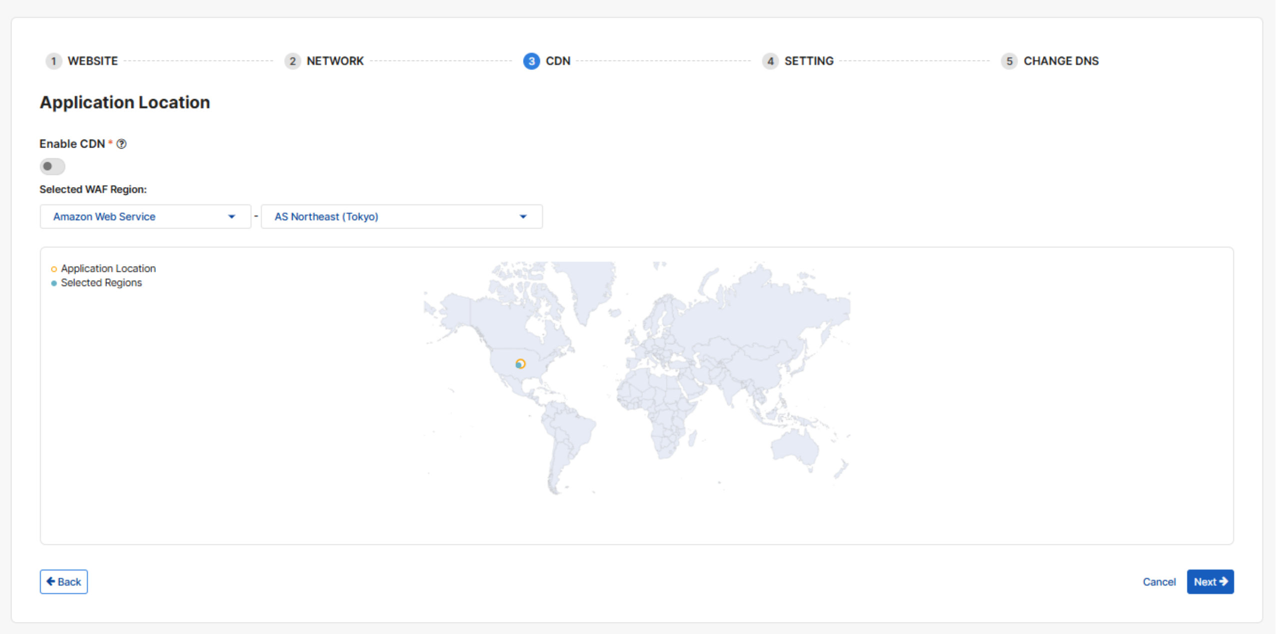
○ Customize

Server Protocol *

HTTPS

a. Select the services allowed on your application and their corresponding ports. FortiAppSec Cloud listen for HTTP and/or HTTPS traffic on the selected ports to allow only legitimate traffic to pass through.
   The default port number for HTTP is 80, and for HTTPS is 443. You can change it to a value between 1-65 535 (inclusive). Make sure the port numbers for HTTP and HTTPS are not duplicate.
   If the port number you want to use is not in the drop-down list, please contact FortiAppSec Cloud Support or your sales engineer to customize the port number. Please note that not all non-standard ports can be used. For details on port and traffic configurations, seeEndpoints on page 61.
   If you would like to use additional ports on the same domain, please see Adding additional HTTP or HTTPS ports to your domain on page 23.
b. Select the IP address/FQDN for your web application. FortiAppSec Cloud will direct traffic to the specified IP address.
   FortiAppSec Cloud automatically fetches and displays available IP addresses and/or FQDNs associated with your entered domain, using port 443 as the default. FortiAppSec Cloud keeps this information up to date.
   You can also choose **Customize** to enter a different IP address/FQDN and port number.
   If there are multiple origin servers hosting your web application, you can add them later in **Network > Origin Servers**.
c. Under **Server Protocol**, you can configure the connection between FortiAppSec Cloud and the origin server. If you want to redirect HTTP traffic to HTTPS, ensure that you have selected HTTPS.
d. Ensure FortiAppSec Cloud service IPs from Step 1 are successfully added to your application's firewall before proceeding to the next step.
e. Click **Test Origin Server** to ensure that FortiAppSec Cloud can connect to the origin server. By default, FortiAppSec Cloud sends request to the URL path "/" to test responsiveness of the server, then populates the response code received from the server in the **Response Code** field of the load balancing rule in **Network > Origin Servers**.

7. **Application Location**



Application Location

Enable CDN *

Selected WAF Region: Amazon Web Service - AS Northeast (Tokyo)

In this step, FortiAppSec Cloud automatically selects a scrubbing center for your application according to the following conditions:

- FortiAppSec Cloud checks whether your application server is deployed on AWS, Azure, and Google Cloud, then assigns a corresponding scrubbing center on the same cloud platform as your application server.
- If your application server is deployed elsewhere, FortiAppSec Cloud by default assigns a scrubbing center on AWS.

See How does WAF choose regions? on page 37 for more information.

After onboarding, you can switch the chosen scrubbing center within **WAF > Applications**. However, you cannot select a scrubbing center from a different cloud platform. For instance, if your application server is on AWS, you cannot pick scrubbing centers deployed on Azure.

a. **Content Delivery Network (CDN)**

If you enable CDN, the data on your origin servers can be cached in FortiAppSec Cloud scrubbing centers distributed around the world. When users visit your application, they can be directed to the nearest scrubbing center and rendered with the requested data.

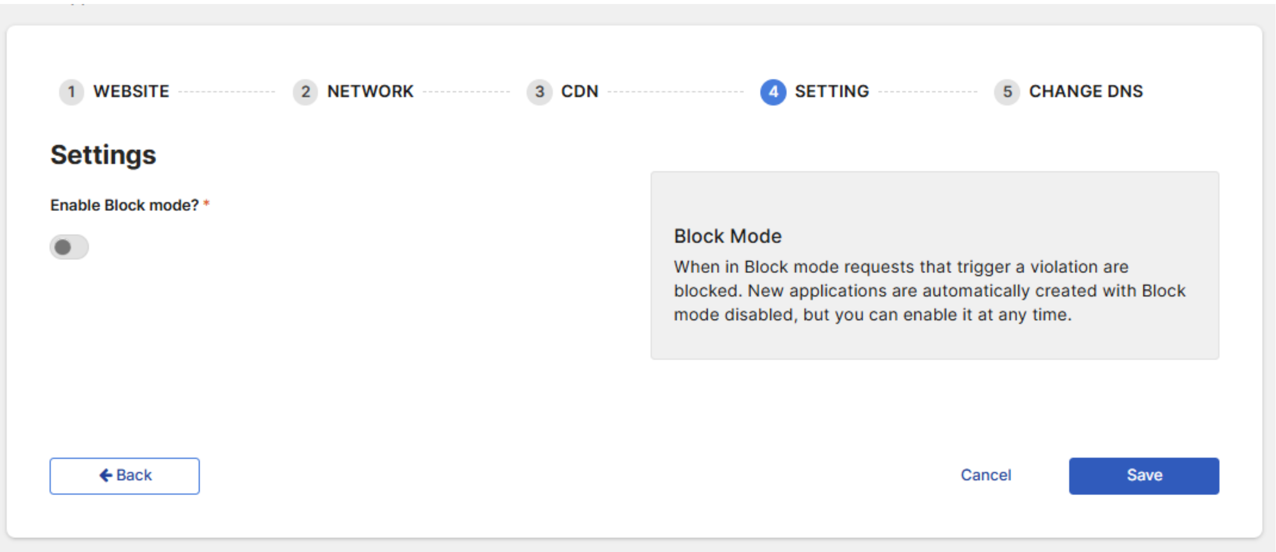
With CDN enabled, you will be asked to select a specific continent or Global, which means your data will be cached on the scrubbing centers within a specific continent or around the world. Selecting a continent may reduce your traffic expense as data transfer is restricted within a continent rather than globally. For the impact on traffic expense when CDN is enabled, see CDN on page 38 for more information.

By default, CDN is not enabled. This keeps your traffic bill to a minimum. Moreover, keeping traffic within the same region can help address compliance concerns.

However, if user experience is your top concern, we recommend enabling CDN.

If you can't decide now, you can revisit this option in **WAF > Applications** after this application is onboarded.

8. **Settings**



Settings

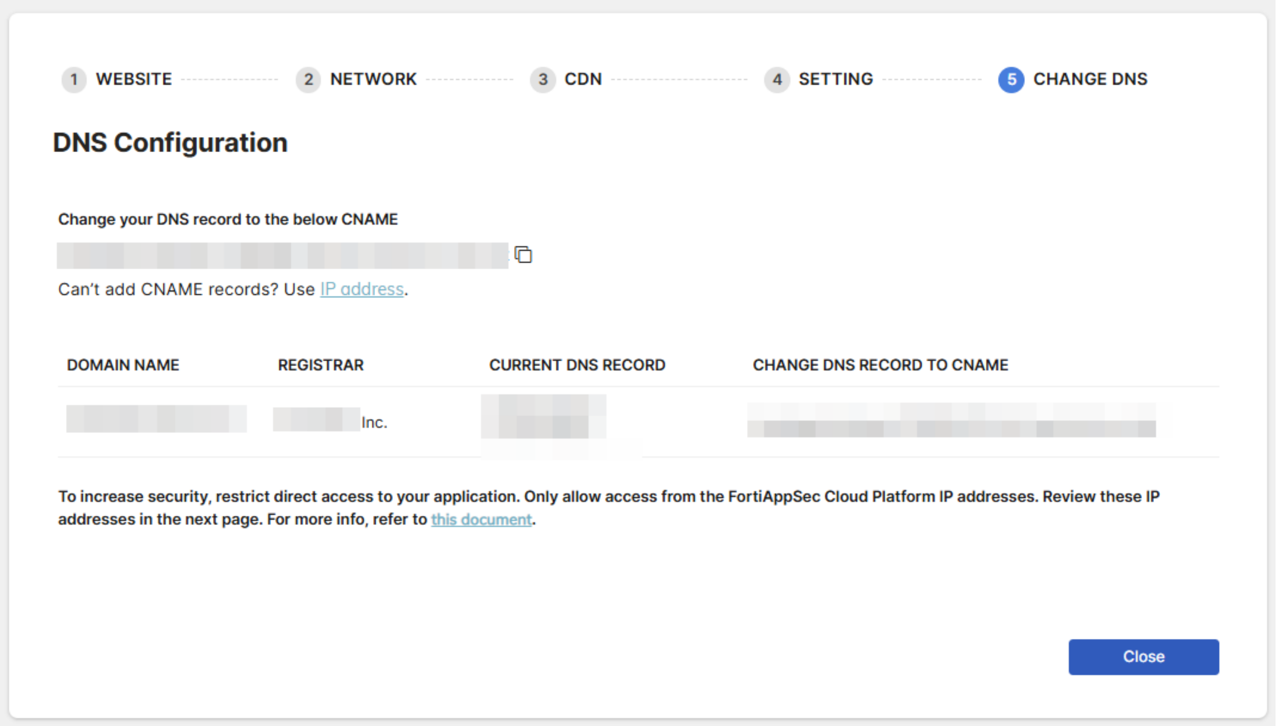
Enable Block mode? *

Block Mode

When in Block mode requests that trigger a violation are blocked. New applications are automatically created with Block mode disabled, but you can enable it at any time.

- When **Block mode** is enabled, FortiAppSec Cloud blocks requests if they trigger a violation. It's recommended to leave it disabled at the first week. During this period you can observe the attack logs and fine-tune the web protection configurations.
  You can later enable the Block Mode in **Dashboard** when you are confident that the traffic flow is stable and the legitimate traffic is not falsely blocked as attacks.

9. **DNS configuration**



DNS Configuration

Change your DNS record to the below CNAME

[redacted]

Can't add CNAME records? Use IP address.

DOMAIN NAME	REGISTRAR	CURRENT DNS RECORD	CHANGE DNS RECORD TO CNAME
[redacted]	[redacted] Inc.	[redacted]	[redacted]

To increase security, restrict direct access to your application. Only allow access from the FortiAppSec Cloud Platform IP addresses. Review these IP addresses in the next page. For more info, refer to this document.

Go to your DNS provider, update your DNS record, and create a new record for the Automatic Certificate challenge as recommended. This ensures that traffic to your application can be correctly directed to FortiAppSec Cloud.

If there are multiple DNS records corresponding to the domain name, make sure to change all the records using the provided . Otherwise, users may encounter error when visiting your application. If the traffic to your application server should be first forwarded to a Content Distribution Service such as AWS CloudFront, before flowing to FortiAppSec Cloud for threat detection, refer to Using WAF behind a Content Distribution Service on page 161. Please note that FortiAppSec Cloud cannot get the DNS status if you use CloudFront, so the DNS status will always be "Unknown" whether or not you have added the DNS record. Here we provide an example to show how to change the DNS record: Example: Changing DNS records on AWS Route 53

Note: You cannot directly access your website with the provided CNAME if you have not added the CNAME record in your DNS server. If you want to test it before changing the DNS record, follow steps below.

1. Run `ping` or `nslookup` command to get the IP address of CNAME.
2. Modify the hosts file on your Windows or Linux by adding your application's domain name (for example, `www.<domain_name>.com`) and mapping it to the IP address obtained from Step a.
3. Access the domain name with the browser to test it.

10. To access the application you just onboarded, navigate to **WAF > Applications** and click the name of the application.

11. The application security modules will appear in the navigation pane. FortiAppSec Cloud automatically assigns a security policy with the most basic web protection rules enabled. You can select additional protection rules using the **Modules** tab. See Add and Remove Modules on page 83.

Adding additional HTTP or HTTPS ports to your domain

You can host multiple applications on the same domain and origin server, each distinguished by a different port. For example:

- app1 – www.example.com:443/app1
- app2 – www.example.com:8443/app2

To manage traffic across multiple HTTP or HTTPS ports, create multi-port applications by repeating the Onboarding steps on page 19, using the same domain but specifying different ports each time.

The following directions highlight the necessary configurations to consider when establishing multi-port applications.

1. Follow Onboarding steps on page 19 to create the first application for your domain, ensuring to enter your root domain as the first domain in the **Web Application Configuration** step. An example of a root domain is fortinet.com, whereas shop.fortinet.com would be considered a subdomain.

Before creating your first multi-port application, please note the following:

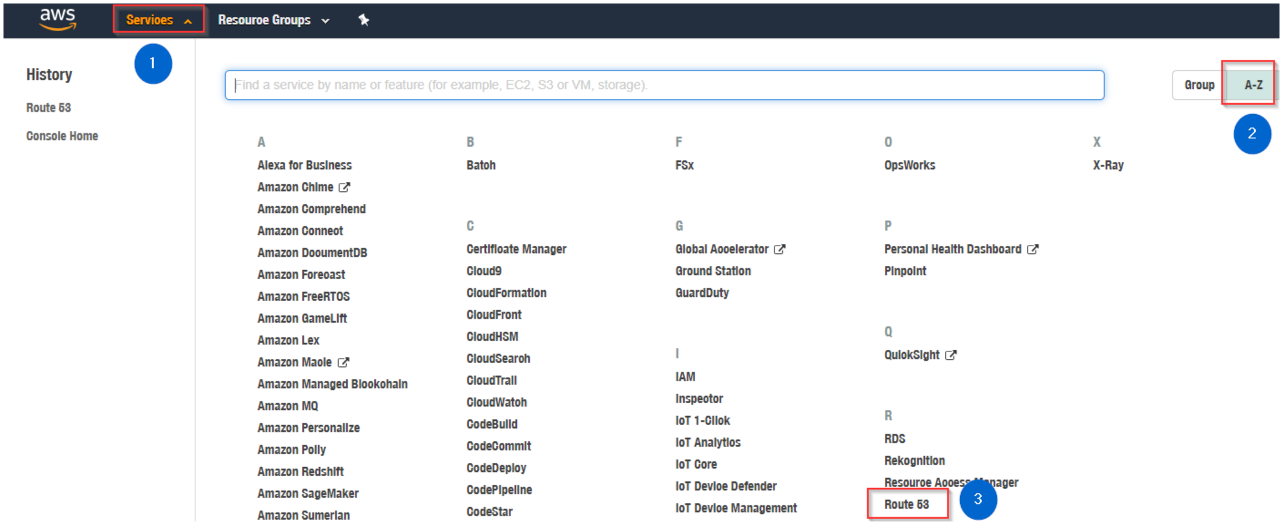
- If you need to onboard multiple ports using the same protocol (e.g., HTTPS port 443 and HTTPS port 8443) for the same domain, you must onboard each port as a separate application.
- You cannot change the region/CDN while multi-port is enabled. If you need to make edits to region/CDN on your application, we recommend doing this before adding any multi-port applications.
  - To switch regions or CDNs, delete all multi-port applications of a domain, leaving only the original application. After changing the region, you will need to manually recreate the multi-port applications to resume traffic from other ports.
- If you need to use a custom certificate on an application, please re-input the certificate for each multi-port.
- When managing sub-domains with different port requirements, it is best to create them as separate applications. This approach ensures each sub-domain can independently manage its specific port settings without overlapping configurations.

2. Return to **WAF > Applications** to add your first multi-port application.
3. Click **Add Application**.
4. In the **Web Application Configuration** step, ensure the root domain you used to create the first application for this domain is listed as the first entry under **Domain Name**. For more details on the configuration options on this page, see above.
5. Under **Network Settings**, select the HTTP and/or HTTPS ports you would like to add to your application.
   a. Since we are configuring a multi-port application, be sure to select **Customize** and manually enter the origin server.
   b. On the same page, click **Test Origin Server**. If FortiAppSec Cloud detects multiple applications with the same domain, you will encounter a message in the top-right corner of your window that indicates you are creating a multi-port application.
6. On the **CDN** step, you will be unable to change the settings on this page due to multiport being enabled. Click **Next** to move onto the next step.
   - To switch regions or CDNs, delete all multi-port applications of a domain, leaving only the original application. After changing the region, you will need to manually recreate the multi-port applications to resume traffic from other ports.
7. On the **Setting** step, configure **Block mode** and **Template** for your multiport application. For details on these configuration options, see above.
8. The **Change DNS** step provides the same instructions as when you first created your application's initial instance. If you have already completed these steps, you can simply click **Close** to exit the wizard, as there is no need to repeat them.

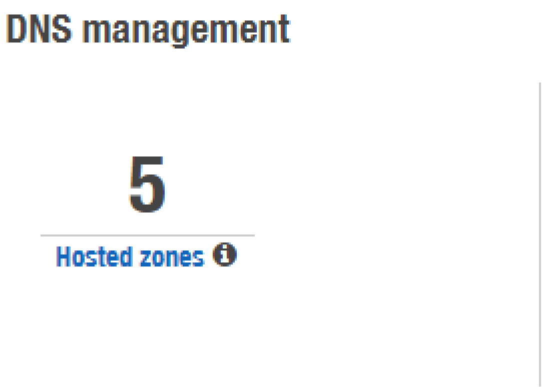
Example: Changing DNS records on AWS Route 53

To illustrate how to change DNS records using the CNAME provided by FortiAppSec Cloud, this example assumes you are using AWS Route 53 as your DNS provider.

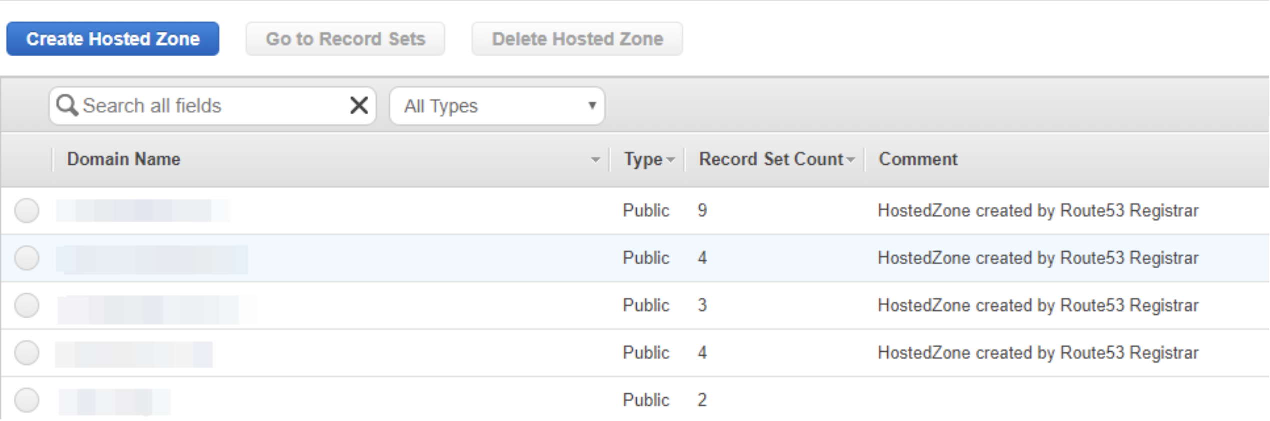
1. Log in to AWS. Select **Route 53**.



2. Click **Hosted zones** under **DNS management**.



3. Select the domain name of your application.

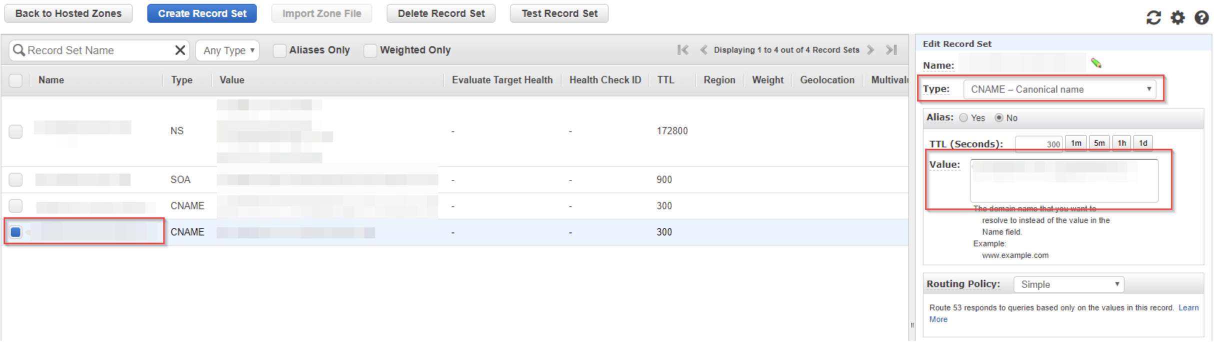


	Domain Name	Type	Record Set Count	Comment
○	[redacted]	Public	9	HostedZone created by Route53 Registrar
○	[redacted]	Public	4	HostedZone created by Route53 Registrar
○	[redacted]	Public	3	HostedZone created by Route53 Registrar
○	[redacted]	Public	4	HostedZone created by Route53 Registrar
○	[redacted]	Public	2	

4. Check the box before the domain name starting with "www.". The **Edit Record Set** pane will appear at the right side.

a. Select **CNAME - Canonical name** for the **Type**.

b. Delete the IP address(es) in the **Value** field, then paste the CNAME provided by FortiAppSec Cloud.



☐	Name	Type	Value	Evaluate Target Health	Health Check ID	TTL	Region	Weight	Geolocation	Multival
☐	[redacted]	NS	[redacted]	-	-	172800				
☐	[redacted]	SOA	[redacted]	-	-	900				
☐	[redacted]	CNAME	[redacted]	-	-	300				
☑	[redacted]	CNAME	[redacted]	-	-	300				

Name: [redacted]

Type: CNAME – Canonical name

Alias: ○ Yes ● No

TTL (Seconds): 300 1m 5m 1h 1d

Value: [redacted]

The domain name that you want to resolve to instead of the value in the Name field.
Example:
www.example.com

Routing Policy: Simple

Route 53 responds to queries based only on the values in this record. Learn More

Changing IP addresses of origin servers

After the DNS records are changed, when users visit your application, the traffic is directed to FortiAppSec Cloud instead of your back-end servers. Users will not be aware of the IP addresses of your back-end servers, but the IP addresses may exist in historical DNS lookups that were archived before you activated FortiAppSec Cloud service. This could allow an attacker to bypass FortiAppSec Cloud and attack your network infrastructure directly.

Therefore, it's recommended to change the IP addresses of your origin servers. Once they are changed, remember to update the IP address in **Network > Origin Servers** so that FortiAppSec Cloud can correctly forward traffic to the new address.

Restricting direct traffic & allowing FortiAppSec Cloud IP addresses

Restricting direct traffic

Once you complete setting up FortiAppSec Cloud, configure your application servers to only accept traffic from FortiAppSec Cloud IP addresses.

- If CDN is enabled, make sure to accept traffic from **all the IP addresses listed in the following tables, including the service management IPs and the scrubbing centers' IPs**.
- If CDN is not enabled, configure to accept traffic from **the service management IPs and the scrubbing center assigned to your application server.**

However, it's recommended to accept traffic from all the following IP addresses, so that you don't need to go back and accept more IP addresses if you change the CDN status from disabled to enabled.

To know which scrubbing centers are assigned to your application, see How does WAF choose regions? on page 37

Allowing FortiAppSec Cloud IP addresses

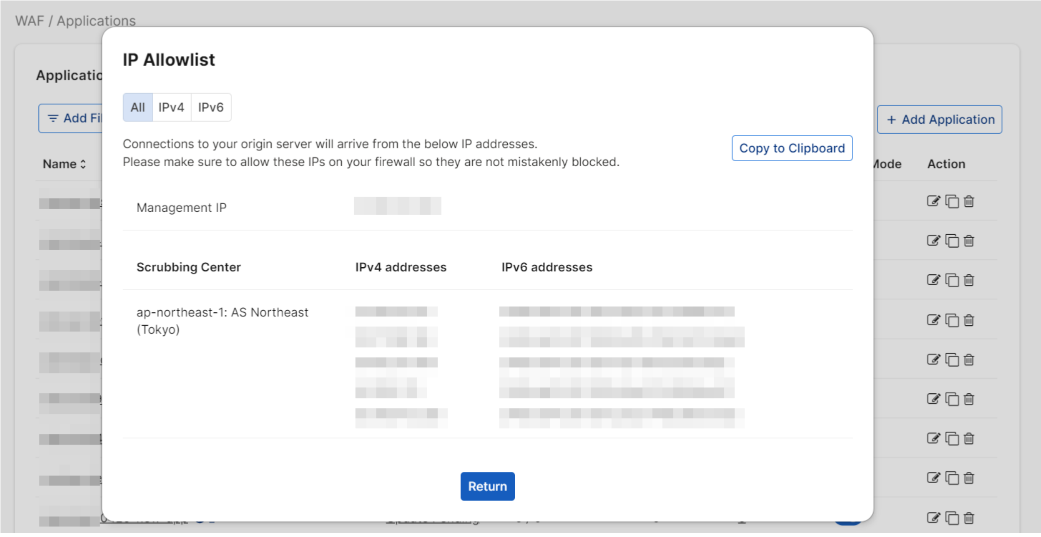
If you have deployed a DDoS device or system in your environment, it's most likely that FortiAppSec Cloud's behavior will be detected as DDoS attacks, because all the requests arriving at your application server have FortiAppSec Cloud's IP addresses as their source IP addresses.

To avoid this, we highly recommend you to **add FortiAppSec Cloud IP addresses to the allowlist of your DDoS device or system before onboarding applications.**

The IP addresses labeled offline in the following tables are backup IP addresses, which can be used when the other IP addresses fail to work.

View the IP addresses of your region in **WAF > Applications** by clicking the **Allow IP List** button. A window will pop up displaying all Cloud Waf IPs that need to be added to the firewall.

You can also filter for Platform, Name, and Domain Name by clicking **Add Filter** before clicking **Allow IP List**.



Connections to your origin server will arrive from the below IP addresses.
Please make sure to allow these IPs on your firewall so they are not mistakenly blocked.

Management IP	[redacted]

Scrubbing Center	IPv4 addresses	IPv6 addresses
ap-northeast-1: AS Northeast (Tokyo)	[redacted]	[redacted]

We have provided two web pages listing all of the IPv4 and IPv6 addresses of the FortiAppSec Cloud scrubbing centers: https://appsec.fortinet.com/ips-v4 and https://appsec.fortinet.com/ips-v6. These URLs can be referenced on a FortiGate as a "Threat Feed" which is dynamically kept up-to-date by the firewall, and can be referenced in security policy.

FortiAppSec Cloud service management IP

The IP addresses of FortiAppSec Cloud's services. Please add these IPs to your allowlist before onboarding applications.	3.123.68.65 3.226.2.163

FortiAppSec Cloud scrubbing centers on AWS

Scrubbing centers	IPv4 addresses	IPv6 addresses
ap-east-1: Asia Pacific (Hong Kong)	18.166.240.188 18.167.155.174 16.163.110.210 18.167.190.240 16.163.212.249 18.166.175.52	2406:da1e:b:ae01:31b6:202a:2bbc:79da 2406:da1e:b:ae02:f3f4:38fa:d7a2:311a 2406:da1e:b:ae01:b1ae:20d2:703f:a868 2406:da1e:b:ae01:841e:27d4:4642:5f7f 2406:da1e:b:ae02:5b3d:9808:f840:b303 2406:da1e:b:ae01:b528:d77c:b017:a202

	18.162.227.141	2406:da1e:b:ae02:52f5:30d5:fc8f:9e90
	16.163.242.5	2406:da1e:b:ae02:834:c479:bb88:c6a3
	16.163.124.127	2406:da1e:b:ae01:a0a5:c899:1d21:e1ce
	43.199.84.130	2406:da1e:b:ae02:ddac:1397:4f82:7017
ap-southeast-1: Asia Pacific (Singapore)	54.179.22.186	2406:da18:ad1:1101:da8c:5ad5:b55e:5f54
	18.140.21.233	2406:da18:ad1:1102:4019:44c9:e3ab:b2f6
	18.136.170.71	2406:da18:ad1:1101:b6ad:34de:de05:5ef3
	13.214.45.126	2406:da18:ad1:1102:9a1c:767e:1e67:4763
	52.77.123.220	2406:da18:ad1:1101:f6f4:fec3:429b:cf21
	13.215.241.201	2406:da18:ad1:1102:bcae:7ecd:6d98:a06
	13.251.178.146	2406:da18:ad1:1101:5dbb:604b:b5b6:b092
	52.220.49.161	2406:da18:ad1:1101:7215:137a:bfff:f7
	13.228.126.80	2406:da18:ad1:1102:2df2:b6fb:c048:dcac
	46.137.210.76	2406:da18:ad1:1102:1fc8:c6a3:c12:9ac5
	18.143.84.232	2406:da18:ad1:1101:ddf6:6845:3795:84c3
	13.215.104.1	2406:da18:ad1:1102:93af:8c33:5642:f98a
ap-southeast-2: Asia Pacific (Sydney)	13.236.106.64	2406:da1c:607:e201:df9c:6ba:4f89:6fd9
	13.237.77.127	2406:da1c:607:e202:a298:e79a:d84b:cabc
	13.237.159.2	2406:da1c:607:e201:dbc1:8ad8:624d:f906
	54.79.207.53	2406:da1c:607:e202:30fe:b581:362b:e8b2
	13.54.172.164	2406:da1c:607:e201:b8e0:4de5:dcdf:209c
	13.210.41.167	2406:da1c:607:e202:9969:3b23:e201:e814
	54.252.85.192	2406:da1c:607:e201:6e34:9ff2:ecb:c8eb
	54.153.144.173	2406:da1c:607:e201:c0e7:f44c:7012:266a
	52.62.180.47	2406:da1c:607:e202:1f5c:8b63:fbf2:28ea
	54.253.109.15	2406:da1c:607:e202:5cd7:fd2f:1b8a:2091
	52.65.156.69	2406:da1c:607:e201:3e39:ff28:7339:8097
	52.62.143.64	2406:da1c:607:e202:952a:165b:da05:c591
ap-south-1: Asia Pacific (Mumbai)	15.207.198.87	2406:da1a:31:d501:50e1:400b:5699:2427
	15.206.52.49	2406:da1a:31:d502:c14e:dcc9:5307:e359
	3.109.248.211	2406:da1a:31:d501:fc19:5e59:9804:b392
	3.109.17.189	2406:da1a:31:d502:2eaf:153f:91b3:7dc0
	13.234.208.160	2406:da1a:31:d501:8064:5da4:4a3:5458
	3.108.143.49	2406:da1a:31:d502:f7cf:30d8:60f3:ba2b
	43.204.40.78	2406:da1a:31:d501:a644:652c:8e74:fa57
	13.235.108.225	2406:da1a:31:d501:1972:5dbb:6a15:8486
	13.232.35.27	2406:da1a:31:d502:bf3a:f0ac:d480:ed98
	3.7.99.1	2406:da1a:31:d502:9828:451c:2e84:e42b
ca-central-1: Canada (Central)	52.60.112.90	2600:1f11:8c:9101:250e:bf5a:6646:e527
	99.79.174.29	2600:1f11:8c:9102:abb2:7f29:6f98:ea53

	3.97.158.98	2600:1f11:8c:9101:eb3:39f1:1815:884e
	3.97.249.50	2600:1f11:8c:9102:411d:63f2:e5b4:5209
	3.99.18.71	2600:1f11:8c:9101:d917:6c:8f07:f193
	99.79.119.81	2600:1f11:8c:9102:729e:b7b1:34c:1e53
	99.79.85.123	2600:1f11:8c:9101:86ea:d6ff:c7f0:ad44
	15.223.11.8	2600:1f11:8c:9101:be54:e939:1483:fce6
	3.99.0.8	2600:1f11:8c:9102:974e:4977:6617:28a
	15.157.150.33	2600:1f11:8c:9102:4343:6783:f527:d50
	99.79.109.86	2600:1f11:8c:9101:7acc:dbee:9e4:388f
	3.98.193.86	2600:1f11:8c:9102:22b1:838f:d734:206f
eu-central-1: Europe (Frankfurt)	3.121.49.99	2a05:d014:f3c:6c01:cf53:8a1:630:517e
	3.120.253.91	2a05:d014:f3c:6c02:30e:dcf4:4b91:8e01
	18.192.229.245	2a05:d014:f3c:6c01:8571:cefb:8d43:6d3c
	18.192.220.216	2a05:d014:f3c:6c02:2712:69b4:cf65:e99e
	18.192.64.32	2a05:d014:f3c:6c01:99d0:8c50:ae51:99ac
	3.125.233.133	2a05:d014:f3c:6c02:58:3e12:a98a:df9f
	35.156.146.120	2a05:d014:f3c:6c01:24c5:1d8d:b3be:2785
	35.158.251.28	2a05:d014:f3c:6c02:2490:b345:e759:f43f
	3.69.183.166	2a05:d014:f3c:6c01:e799:dd65:59c7:d4b7
	3.69.202.9	2a05:d014:f3c:6c02:af21:546d:5054:a7e3
	18.184.56.149	2a05:d014:f3c:6c01:ae76:adc3:661d:29dc
	3.72.137.154	2a05:d014:f3c:6c02:9041:85c2:24f5:592f
	3.127.31.213	2a05:d014:f3c:6c01:5e7a:1eba:64:30ce
	52.58.147.238	2a05:d014:f3c:6c02:3b5d:afaa:1d4:b8f1
	18.198.141.132	2a05:d014:f3c:6c01:4508:b102:6ece:86cf
	3.76.87.93	2a05:d014:f3c:6c02:f2cd:f562:1b85:dd7e
	3.64.17.229	2a05:d014:f3c:6c01:a132:73e8:5b25:904d
	35.156.103.46	2a05:d014:f3c:6c02:d36d:b5c3:b578:42de
	18.153.249.55	2a05:d014:f3c:6c01:3d9f:78e9:cfe6:8fb8
	18.153.247.125	2a05:d014:f3c:6c02:362:f81c:4417:a46a
	18.199.124.228	2a05:d014:f3c:6c01:251c:aa6f:2e81:b475
	3.124.48.4	2a05:d014:f3c:6c02:637f:8a2c:c2b8:5f66
	3.75.13.123	2a05:d014:f3c:6c01:9ae:e462:f857:4d6f
	35.157.14.224	2a05:d014:f3c:6c02:cb12:de20:12df:f20a
	18.153.222.237	2a05:d014:f3c:6c01:71dd:486f:5168:e073
	18.185.176.240	2a05:d014:f3c:6c02:3a4e:18cf:798c:d646
	3.70.79.202	2a05:d014:f3c:6c01:c8a9:a499:8c3:387f
	3.123.214.216	2a05:d014:f3c:6c02:81cb:8138:9904:877b
eu-west-1: Europe (Ireland)	54.72.157.51	2a05:d018:77c:d901:e1bc:f536:85bb:5caa
	52.214.147.155	2a05:d018:77c:d902:f60f:e089:c3ca:3743
	54.78.90.129	2a05:d018:77c:d901:4f37:924f:6ea2:5952

	54.217.132.119	2a05:d018:77c:d902:6605:9bef:2ca3:f220
	34.253.16.245	2a05:d018:77c:d901:67a0:bb76:3597:b7f7
	54.78.225.214	2a05:d018:77c:d902:a9ce:15bb:562f:7549
	52.31.156.114	2a05:d018:77c:d901:7254:99fb:fee0:91c7
	3.250.247.85	2a05:d018:77c:d901:12e0:4d59:ac0d:cceb
	34.241.85.225	2a05:d018:77c:d902:608:4e5c:54c2:d4e2
	52.50.196.213	2a05:d018:77c:d901:1509:1b4a:e9a1:8ce7
	18.200.105.101	2a05:d018:77c:d902:4573:afbf:daf7:730a
	54.155.96.156	2a05:d018:77c:d901:773d:f955:ee1c:211b
	3.248.8.46	2a05:d018:77c:d902:ca48:a3c8:4c3:2e68
	52.16.85.38	2a05:d018:77c:d902:56a0:22a1:7c99:249e
eu-west-2: Europe (London)	18.130.214.145	2a05:d01c:64d:7001:5b0c:f5e1:f737:b883
	3.9.251.147	2a05:d01c:64d:7002:e25b:55e:1564:21fd
	18.134.173.119	2a05:d01c:64d:7001:7f27:28fe:f43b:e55b
	52.56.112.105	2a05:d01c:64d:7002:a0b0:a076:53b2:31e3
	3.11.174.119	2a05:d01c:64d:7001:dfb8:aa3d:3848:f26b
	3.11.12.196	2a05:d01c:64d:7002:c77f:a8c8:7655:1cd1
	3.11.216.166	2a05:d01c:64d:7001:d15a:3e1b:337f:92d7
	18.168.230.94	2a05:d01c:64d:7001:1e54:38a8:2653:4d95
	18.130.48.8	2a05:d01c:64d:7002:8a95:b846:2f49:ca5b
	18.170.8.138	2a05:d01c:64d:7001:641e:9663:739a:33ca
	18.168.188.14	2a05:d01c:64d:7002:e585:8452:6fea:c326
	18.169.44.51	2a05:d01c:64d:7002:51cd:11f6:346b:427b
	18.169.78.110	2a05:d01c:64d:7001:630d:1274:991f:4a4b
	3.11.160.214	2a05:d01c:64d:7002:31a:aec6:34ae:ed35
eu-west-3: Europe (Paris)	35.181.28.236	2a05:d012:c22:9a01:77e0:8f18:fb7e:fb1e
	52.47.112.113	2a05:d012:c22:9a02:fa49:295e:27d5:1821
	13.36.206.34	2a05:d012:c22:9a01:d23a:98af:1e6c:c9fb
	15.188.2.107	2a05:d012:c22:9a02:fc4a:2226:47cd:66f5
	35.181.84.20	2a05:d012:c22:9a01:6fbc:eb92:7eb5:fa4a
	13.36.245.25	2a05:d012:c22:9a02:a1ca:7e27:28f7:bbba
	35.181.130.113	2a05:d012:c22:9a01:f7c8:b42:a1d9:1c5e
	13.36.99.148	2a05:d012:c22:9a01:85ed:d68a:483:26c7
	35.180.221.56	2a05:d012:c22:9a02:daa8:f4b8:3356:98e6
	13.39.124.108	2a05:d012:c22:9a01:335f:ba6:f76:df50
	13.36.113.40	2a05:d012:c22:9a02:b26d:7261:bc18:48c8
	13.39.206.156	2a05:d012:c22:9a02:d70e:14f7:38c1:cfea
	15.236.0.147	2a05:d012:c22:9a01:2f37:1078:a43b:e490
	15.236.1.140	2a05:d012:c22:9a02:fb38:76cf:630d:3f56
eu-south-1: Europe (Milan)	15.161.173.116	2a05:d01a:9f2:1701:bd84:9314:f93:b2f

	15.161.10.152	2a05:d01a:9f2:1702:aca5:5d4d:1995:50d
	15.161.180.29	2a05:d01a:9f2:1701:13eb:55d7:25e3:89d3
	15.160.64.9	2a05:d01a:9f2:1702:28b0:2a0b:32a5:ff36
	15.161.215.247	2a05:d01a:9f2:1701:4d5b:f1a8:d291:5a84
	15.161.76.114	2a05:d01a:9f2:1702:8e71:e939:c954:1608
	18.102.20.169	2a05:d01a:9f2:1701:eb19:dfb0:2ba0:9782
	18.102.26.204	2a05:d01a:9f2:1702:306c:6cac:b6f3:d03e
	35.152.36.51	2a05:d01a:9f2:1701:9734:6666:5d:40ec
	15.161.83.238	2a05:d01a:9f2:1701:53ba:32e9:7ef2:198f
	18.102.19.162	2a05:d01a:9f2:1702:dead:f4ac:dc23:9d6e
	18.102.146.236	2a05:d01a:9f2:1701:b077:f47d:2a5c:96f2
	15.160.64.40	2a05:d01a:9f2:1702:8ba8:740e:184a:260e
	18.102.87.233	2a05:d01a:9f2:1702:59ca:2da7:dd2b:146b
	18.102.219.109	2a05:d01a:9f2:1701:1b25:a215:5875:d813
	35.152.119.145	2a05:d01a:9f2:1702:a47c:f63f:c623:b639
Il-central-1: AWS Israel (Tel Aviv)	51.16.118.151	2a05:d025:c86:1701:39b:f35d:2126:5c85
	51.17.26.125	2a05:d025:c86:1702:3be9:6a28:de24:3589
	51.16.198.214	2a05:d025:c86:1701:1eb6:57b5:dfe6:4cfb
	51.16.192.242	2a05:d025:c86:1702:4ddf:2b90:a945:ea28
	51.16.117.96	2a05:d025:c86:1701:ed95:3527:e666:1dc9
	51.17.163.97	2a05:d025:c86:1702:ca77:80c5:56ba:45dd
	51.17.82.6	2a05:d025:c86:1701:c217:bc5b:1e9d:6fee
	51.17.169.102	2a05:d025:c86:1702:86b3:95a8:c0b9:6348
us-east-1: US East (N. Virginia)	3.226.118.124	2600:1f18:1492:1701:5ebe:2322:bb2e:1c87
	3.210.115.14	2600:1f18:1492:1702:af7a:a957:dd53:be07
	54.144.250.206	2600:1f18:1492:1701:b42b:c8b6:9d9b:5752
	23.21.42.132	2600:1f18:1492:1702:eebf:68e3:7e83:a9a6
	34.233.191.126	2600:1f18:1492:1701:6910:cfcf:2f0a:9102
	54.198.165.25	2600:1f18:1492:1702:d556:77ec:34ad:4cbb
	3.228.64.186	2600:1f18:1492:1701:e54f:59c6:7114:2878
	3.231.16.50	2600:1f18:1492:1702:e618:cb8e:f4b5:4ba4
	54.156.35.181	2600:1f18:1492:1701:c65b:f5d9:784d:d3d6
	52.22.134.181	2600:1f18:1492:1702:7e65:574b:1013:7209
	3.224.233.117	2600:1f18:1492:1701:c800:b061:afc1:5a2a
	174.129.221.93	2600:1f18:1492:1702:aa32:a7b0:116f:1b69
	3.214.245.110	2600:1f18:1492:1701:7c58:5331:25e3:3343
	3.225.188.145	2600:1f18:1492:1702:b3ff:2b1d:d9a7:9e88
	18.214.30.87	2600:1f18:1492:1701:6451:e2d7:11bc:da4d
	34.206.129.226	2600:1f18:1492:1702:9f57:b34f:ef00:726
	100.25.206.91	2600:1f18:1492:1701:7906:404b:ba59:dff3
	52.44.217.91	2600:1f18:1492:1702:524:eda4:749f:26d6

	54.205.81.107	2600:1f18:1492:1701:a59a:4a1b:5e1a:f223
	54.86.225.255	2600:1f18:1492:1702:a3ca:e551:92ce:e11
	44.193.52.244	2600:1f18:1492:1701:466a:7e31:6843:2aff
	54.163.210.158	2600:1f18:1492:1702:8342:aed:cf3b:5778
	34.233.230.135	2600:1f18:1492:1701:593d:c5ff:683f:9f21
	54.87.7.116	2600:1f18:1492:1702:4345:d995:4961:64e4
	3.229.67.163	2600:1f18:1492:1701:9ece:e23:c0e1:bfd4
	44.209.101.209	2600:1f18:1492:1702:d04:287e:21ce:fd2e
	54.146.253.1	2600:1f18:1492:1701:1209:a2e1:1bf0:3a01
	54.167.149.231	2600:1f18:1492:1702:ef74:1a5:cdc3:1b39
	3.209.143.21	2600:1f18:1492:1701:4c6d:25ab:fdf9:a7d7
	3.221.60.153	2600:1f18:1492:1702:5bd1:324a:aa07:b8aa
us-east-2: US East (Ohio)	3.19.24.89	2600:1f16:160:aa01:f753:ce95:4466:884f
	3.13.39.239	2600:1f16:160:aa02:d842:2cf8:964c:b004
	3.131.242.28	2600:1f16:160:aa01:4584:fec1:ab59:6bd4
	18.188.127.1	2600:1f16:160:aa02:5629:28f1:196d:acbe
	3.139.50.156	2600:1f16:160:aa01:8769:8d0b:d2de:28d4
	18.189.50.81	2600:1f16:160:aa02:2752:5869:d2af:3811
	52.15.38.41	2600:1f16:160:aa01:4b21:e5ce:3c8e:c368
	3.129.83.41	2600:1f16:160:aa01:ad18:2fce:479f:a78f
	3.13.53.24	2600:1f16:160:aa02:3a6:c48:a903:de9
	18.224.115.39	2600:1f16:160:aa01:1749:9160:1c6a:5e9f
	3.134.201.211	2600:1f16:160:aa02:b510:7929:d3e6:12e6
	3.142.88.221	2600:1f16:160:aa02:9e47:9f0d:3ba:20dd
	3.130.237.230	2600:1f16:160:aa01:3b72:51b:d36e:493f
	118.189.216.41	2600:1f16:160:aa02:48b6:3a:204a:9dca
	18.220.237.230	2600:1f16:160:aa01:70f:687c:c62c:2c08
	3.139.155.253	2600:1f16:160:aa02:da24:fa44:d70:9b26
us-west-1: US West (N. California)	13.56.33.144	2600:1f1c:b97:d801:6efe:3295:e11a:e6b
	52.52.208.2	2600:1f1c:b97:d802:d788:18f9:b8e3:a981
	52.8.219.206	2600:1f1c:b97:d801:ff83:8b03:7a29:5981
	52.9.219.121	2600:1f1c:b97:d802:fe8f:1a5d:5d1:1c6b
	54.193.111.235	2600:1f1c:b97:d801:e6c4:34b2:d9cb:4147
	52.9.188.134	2600:1f1c:b97:d802:d073:2d49:432:2aa6
	52.9.57.162	2600:1f1c:b97:d801:e507:2d99:87b1:b666
	184.169.166.201	2600:1f1c:b97:d801:8fb0:a6dd:1f2a:54db
	54.176.39.164	2600:1f1c:b97:d802:43f8:ddcc:da5e:b21e
	54.219.216.150	2600:1f1c:b97:d802:2f15:2f75:17b6:5fcf
	52.8.156.63	2600:1f1c:b97:d801:eaf3:6ac3:3991:721d
	54.177.210.74	2600:1f1c:b97:d802:e01e:f4be:a8d5:4d4c

us-west-2: US West (Oregon)	54.70.126.22	2600:1f14:b5a:da01:d056:d959:eb59:49e2
	54.186.80.150	2600:1f14:b5a:da02:88c1:8365:8baf:677
	35.160.55.58	2600:1f14:b5a:da01:a32:4cac:f337:9c00
	44.241.247.81	2600:1f14:b5a:da02:5a8e:d30:ff37:18a9
	35.85.67.11	2600:1f14:b5a:da01:ab8a:9684:cd53:598d
	35.155.214.19	2600:1f14:b5a:da02:fdfa:2560:ae51:20ee
	44.227.236.231	2600:1f14:b5a:da01:df9a:f157:a04a:b1a1
	18.224.115.39	2600:1f16:160:aa01:1749:9160:1c6a:5e9f
	3.134.201.211	2600:1f16:160:aa02:b510:7929:d3e6:12e6
	44.225.123.220	2600:1f14:b5a:da01:a4c6:ab36:7bf9:915d
	34.214.132.181	2600:1f14:b5a:da02:2a4e:edb1:7409:dfb9
	44.239.147.108	2600:1f14:b5a:da02:8fee:96f4:f8a7:4e50
	54.244.221.240	2600:1f14:b5a:da01:ef39:8a5d:b617:b776
	44.228.172.48	2600:1f14:b5a:da02:e725:9ab0:1a19:fdd1
sa-east-1: South America (Sao Paulo)	54.207.7.119	2600:1f1e:653:3201:e41:9bc0:8071:cec0
	18.231.48.25	2600:1f1e:653:3202:2261:f67:9605:ebbe
	54.207.227.252	2600:1f1e:653:3201:eac8:161d:c0a:6915
	177.71.170.92	2600:1f1e:653:3202:3615:6e2c:7b0c:85c9
	18.228.169.208	2600:1f1e:653:3201:8fed:9a99:d38e:4855
	54.207.65.147	2600:1f1e:653:3202:d9f7:e5d7:ab2f:e684
	52.67.36.82	2600:1f1e:653:3201:b266:d210:941f:46bb
	18.229.224.63	2600:1f1e:653:3201:6d62:b616:3070:869f
	15.229.95.152	2600:1f1e:653:3202:cad1:1b69:28e2:ccea
	52.67.231.140	2600:1f1e:653:3201:503e:4983:215f:927e
	54.233.79.85	2600:1f1e:653:3202:5504:9120:fcb1:9b8f
	18.231.19.174	2600:1f1e:653:3202:4b95:263:c2e1:1c57
	54.232.94.159	2600:1f1e:653:3201:6a70:b669:561d:f814
	18.229.109.17	2600:1f1e:653:3202:cdbe:1f7a:922d:7edd

FortiAppSec Cloud scrubbing centers on Azure

Scrubbing centers	IPv4 addresses
West Europe	52.149.70.62
	52.149.99.16
	20.86.129.248
	20.86.49.155
	51.124.233.151
	20.4.62.24
	20.4.62.25
	13.95.206.25
	13.95.206.33

Scrubbing centers	IPv4 addresses
	104.40.255.125 13.80.68.18 13.80.71.152 20.73.191.71 40.118.97.197 104.40.145.18
West US2	40.90.196.194 40.90.208.131 20.29.202.53 20.29.202.44 20.29.202.61 20.230.223.218 20.230.221.119 52.183.97.246 52.229.14.118 20.230.252.6 40.125.64.146
Central US	13.89.246.133 40.69.174.31
East US	40.90.225.162 40.90.250.88 52.151.250.58 20.62.192.27 20.127.74.161 20.127.74.103 20.127.74.143 172.190.214.230 172.190.214.225 20.228.249.214 52.179.7.200 52.179.3.225 52.191.198.64
East US2	20.69.235.177 20.81.153.33 20.110.208.49 20.110.186.177 20.14.167.255 20.65.95.32 20.10.155.255

Scrubbing centers	IPv4 addresses
	172.176.244.200 172.176.244.209 172.177.255.185 172.177.255.142 172.176.232.149 172.206.86.197 172.206.86.195 172.172.52.190 172.200.234.40 172.200.235.175 20.14.134.254 20.10.187.167 104.208.237.249 40.123.43.190 20.119.242.55 20.119.242.87
Australia East	20.70.160.47 20.70.152.97 20.248.200.0 20.248.200.83 20.28.181.79 20.28.181.228 20.211.108.201 20.211.108.212 20.188.247.221
Brazil South (São Paulo State)	20.195.163.139 20.197.225.122 20.226.106.176 20.226.106.172 4.228.89.120 4.228.89.123 104.41.51.57 104.41.59.236 4.228.210.23 20.226.12.235 4.228.89.120 191.234.179.164
Canada Central	20.63.56.203 20.63.58.199

Scrubbing centers	IPv4 addresses
	20.48.236.10 20.48.236.225 20.220.63.30 20.220.59.101 20.116.38.42 20.104.214.139 52.237.13.214 4.206.56.140 4.206.58.217
Qatar Central	20.173.66.255 20.173.66.249 20.173.68.52 20.173.68.54 20.173.68.114 20.173.68.96 20.173.78.67 10.39.1.40

FortiAppSec Cloud scrubbing centers on Google Cloud

Scrubbing centers	IPv4 addresses
europe-west3 (Frankfurt)	35.242.209.119 35.242.218.171 34.159.173.59 35.198.124.236 35.246.131.195 35.234.100.121 35.242.250.207
europe-west8 (Milan)	34.154.63.30 34.154.60.54 34.154.148.78 34.154.84.52 34.154.108.53 34.154.228.43 34.154.63.237
me-west1 (Tel Aviv)	34.165.140.173 34.165.109.6 34.165.80.144 34.165.254.142

Scrubbing centers	IPv4 addresses
	34.165.184.29 34.165.1.25 34.165.47.110
us-east1 (South Carolina)	34.74.199.185 35.227.112.86 34.148.6.49 34.138.149.79 35.227.32.42 35.185.18.199 34.74.77.198
us-west1 (Oregon)	34.83.129.59 34.82.233.199 34.83.15.189 34.168.224.208 35.233.207.179 34.82.36.119 34.127.22.16

FortiAppSec Cloud scrubbing centers on OCI

Scrubbing centers	IPv4 addresses
US East (Ashburn)	193.122.181.94 129.159.75.103 129.159.74.168 (offline)
US West (Phoenix)	158.101.43.252 158.101.43.253 129.146.233.205 (offline)
Germany Central (Frankfurt)	158.101.176.179 193.122.55.66 132.145.248.29 (offline)

How does WAF choose regions?

When you onboard application, WAF checks the IP address of your origin server to get its location, then suggest a FortiAppSec Cloud scrubbing center based on the following factors:

- First, we determine if your application server is deployed on AWS, Azure, OCI, or Google Cloud.
  - If yes, the scrubbing centers located on the same cloud platform with your application server will be picked out for further screening.

- ◦ If no, the scrubbing center located in EU (Frankfurt) or US East (N. Virginia) region on AWS will be suggested for your application, depending on whether your application server is in Europe or the rest of the world.
- Among the ones picked out against the first criterion, we then determine whether there is a scrubbing center deployed in the same region with your application server.
  - If yes, we will suggest that scrubbing center.
  - If no, the following scrubbing centers will be suggested:

	AWS	Azure	Google Cloud	OCI
For application servers located in Europe	EU (Frankfurt)	West Europe (Netherlands)	Europe-west3 (Frankfurt)	Germany Central (Frankfurt)
For application servers located in the rest of the world	US East (N. Virginia)	East US (Virginia)	Us-east1 (South Carolina)	US East (Ashburn)

If you enable CDN, there will not be a fixed scrubbing center assigned to you. The traffic from your users around the world can be directed to any scrubbing center (depending on whether you have selected a specific continent or Global) which is the closest to them. Be aware that users can't be directed to a cross-platform scrubbing center, for example, if your application server is on AWS, then your users can only be directed to the scrubbing centers on AWS.

With CDN enabled, if your application server is not deployed on the above mentioned cloud platforms, for example, it's deployed in your private on-premise network, then your users will be directed to the AWS regions closest to their locations.

See this article for the regions where FortiAppSec Cloud scrubbing centers are deployed.

CDN

If CDN is enabled, the data on your origin servers will be cached in FortiAppSec Cloud scrubbing centers distributed around the world or within a certain continent. When users request data from your application, they can be directed to the nearest scrubbing center and rendered with the requested data. For the list of scrubbing centers, see Restricting direct traffic & allowing FortiAppSec Cloud IP addresses on page 26.

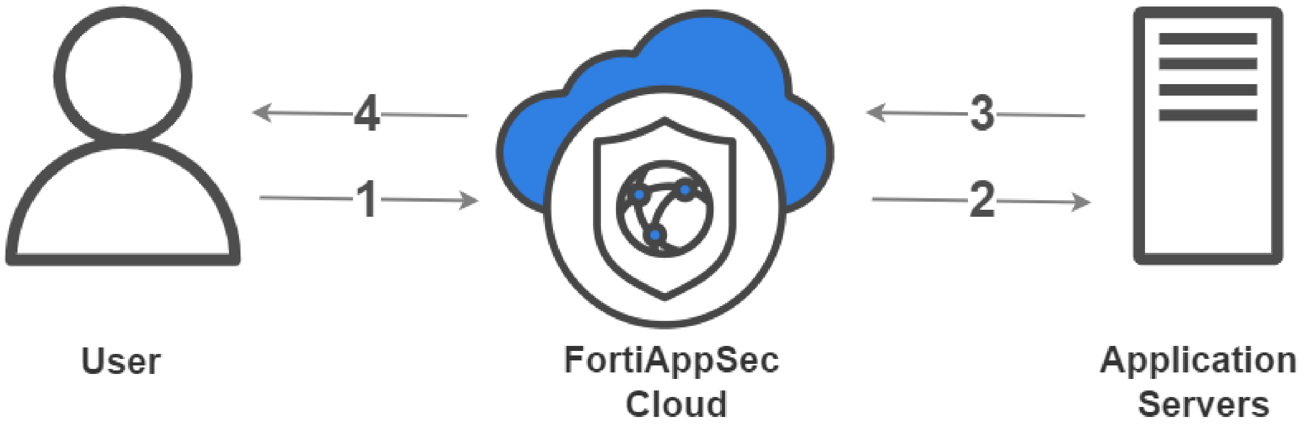
You can enable CDN when onboarding an application, or set this option in the **Application Settings** dialog (**WAF > Applications**).

Traffic expenses with CDN enabled

The traffic expenses may increase if you enable CDN.

The following graph shows a typical traffic flow when a user initiates a request to the data stored on your application server. It helps you understand which part of traffic expense increases if CDN is enabled.

1. User's request first reaches FortiAppSec Cloud scrubbing center for threat detection.
2. FortiAppSec Cloud sends request to your application server to get the data requested by the user.
3. The application server sends response to FortiAppSec Cloud.
4. FortiAppSec Cloud sends response to the user.



Your traffic expense includes the following two parts:

- Expense for traffic flow number 4. That is, the traffic sent from FortiAppSec Cloud to your application users. FortiAppSec Cloud charges for this traffic with a fixed rate. It does not change whether CDN is enabled or not.
- Expense for traffic flow number 3. That is, the traffic outbound from your application server to FortiAppSec Cloud. Your Internet Service Provider (ISP) charges you for this part of the expense. The unit price for this traffic might vary depending on whether CDN is enabled or not.

If CDN is not enabled, you will be assigned with a FortiAppSec Cloud scrubbing center located in the same region with your application server, or a region closest to your application server.

If CDN is enabled, depending on whether you have selected a specific continent or Global, user requests are directed to the nearest FortiAppSec Cloud scrubbing center (either globally or within the specified continent) closest to the user, but it could be far from the places where your application server is located.

So, for traffic flow number 3, the transmission path might be comparatively longer when CDN is enabled. Your ISP probably will charge you with a higher price for the long distance transmission. For example, AWS **intra-region** data transfer is considerably higher than **in-region** data transfer (See AWS pricing policy).

- If your application server is deployed on AWS, Azure, OCI, or Google Cloud, you will be charged for the intra-region data transfer if CDN is enabled.
- If your application server is deployed elsewhere, such as in your private on-premise environment, FortiAppSec Cloud scrubbing centers located on AWS will process the traffic. Please consult your ISP about the price of data transfer between your application server and FortiAppSec Cloud scrubbing center.

Please note that enabling CDN does not always cause the traffic expense to increase. In cases where user request hits the data cached on FortiAppSec Cloud, FortiAppSec Cloud directly sends response to the user. As there isn't any traffic flow from your application server to FortiAppSec Cloud, no expense will incur. By caching data on FortiAppSec Cloud, it saves the cost to fetch data from your application sever every time when users request it.

Data Storage Management

FortiAppSec Cloud provides flexible, compliant data storage management for both cloud applications and on-premises devices, ensuring that your data is securely stored, easily accessible, and fully compliant with regulatory requirements.

It is important to research and understand the privacy regulations in the regions where you operate, as these laws can vary. For example, web applications in the EU must comply with the General Data Protection Regulation (GDPR), which ensures that personal data is stored in compliance with the law, enabling organizations to protect the privacy of EU citizens, ensure explicit consent, and respond quickly to data breaches.

The approach to managing data storage for FortiAppSec Cloud differs depending on whether the user is using a cloud application or an on-premises device.

Cloud application

WAF offers data storage in two regions:

- EU (AWS Frankfurt Region)
- US (AWS N. Virginia Region)

When you create your cloud application, the system automatically detects the IP of the Origin Server. If the IP is from Europe, the EU region is used, and all data is stored in the EU. For IPs from other regions, the data is stored in the US (AWS N. Virginia Region).

This setup ensures that data is stored in the appropriate region based on the geographic location of the origin server's IP address.

On-premises devices

For on-premises devices, attack and incident logs are typically stored locally. However, you have the flexibility to change the data storage location through the **Threat Analytics** interface and switch data storage region between the United States and the European Union. This feature allows on-premises users to select a storage location that meets their specific data governance and compliance needs.

To change the data storage location of your on-premise device,

1. Log into your FortiAppSec Cloud web service.
2. In the side navigation menu, go to **Threat Analytics > Gateways**.
3. Locate the desired device by serial number, and click on the edit icon ✎ in the **Action** column.
4. In the drop down menu, select the desired data storage location.
5. Click **OK** to save your settings.

Understanding block mode and action

Block mode

On **Applications** page, you can turn on/off the **Block Mode** for each application.

When to enable block mode

- When Block Mode is enabled, FortiAppSec Cloud will take actions as specified in Action of each WAF module. Requests that trigger security violations are blocked, preventing them from reaching your application server.
- When Block Mode is disabled, FortiAppSec Cloud only monitors violations and generates logs for them. FortiAppSec Cloud does not block the malicious requests.

Before you enable Block Mode, please check the following prerequisites:

- The endpoints and origin servers are configured properly. The traffic flow between the clients, FortiAppSec Cloud, and your application servers is stable.
- Observe the attack logs in **FortiView** or **Logs**. If legitimate traffic is falsely detected as attacks (also called false positives), add exceptions or modify the web protection configurations to avoid false positives in the future.

Action

When you have enabled **Advanced Configuration** in **WAF > System Settings > Settings**, you can configure actions for each WAF feature specifically. If **Advanced Configuration** is disabled, the default actions of each WAF feature will work instead.

When Block Mode is disabled, FortiAppSec Cloud will accept all requests and generate logs for all violations without considering the specified actions in each WAF feature.

When Block Mode is enabled, all requests will be blocked if they trigger the violation, and the specific actions you have configured in each WAF feature will prevail. For example, if you set the Action for Known Attacks as Alert & Deny, FortiAppSec Cloud will block the request (or reset the connection) and generate a log message.

WAF Workflow and Dashboard Overview

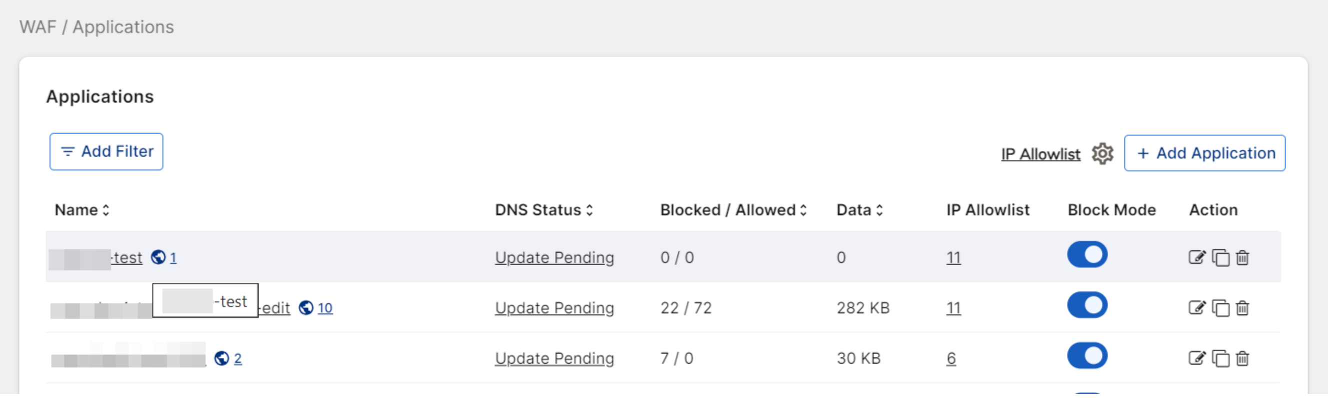
This section provides an introduction to the primary web portal pages for configuring settings and monitoring application activity in FortiAppSec Cloud's WAF service.

Application Page

Many WAF configurations specific to each application, making the **Application** page your central hub for configuring and monitoring individual applications.

On the **Application** page, you can perform actions like creating an application, adjusting the IP allowlist, and editing the name, CDN, and region for each application. For detailed instructions on these tasks, refer to WAF Applications on page 45.

To access WAF's security features, select one of your applications. This brings you to the selected application's WAF security dashboard, and updates the WAF side navigation menu to display the selected application's dashboard, FortiView, network settings, and enabled modules.



WAF / Applications

Applications

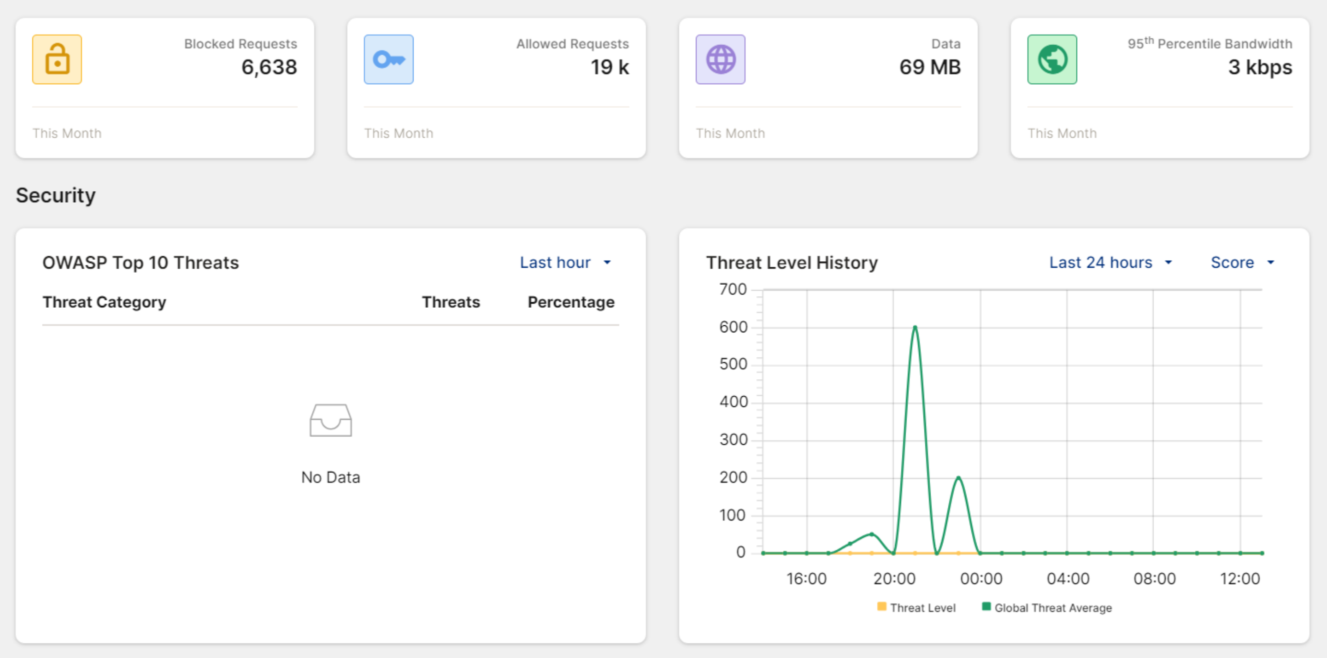
Name	DNS Status	Blocked / Allowed	Data	IP Allowlist	Block Mode	Action
[redacted]-test 1	Update Pending	0 / 0	0	11	●	✎ ⧉ 🗑
[redacted] [redacted]-test edit 10	Update Pending	22 / 72	282 KB	11	●	✎ ⧉ 🗑
[redacted] 2	Update Pending	7 / 0	30 KB	6	●	✎ ⧉ 🗑

Individual Application pages

The pages in this section are accessed by clicking into an application as described above.

Dashboard

This dashboard displays general security insights from the WAF service. For details on the widgets on this page, please refer to WAF Application Dashboard on page 47.



Blocked Requests	Allowed Requests	Data	95th Percentile Bandwidth
6,638	19 k	69 MB	3 kbps
This Month	This Month	This Month	This Month

Security

OWASP Top 10 Threats — Last hour

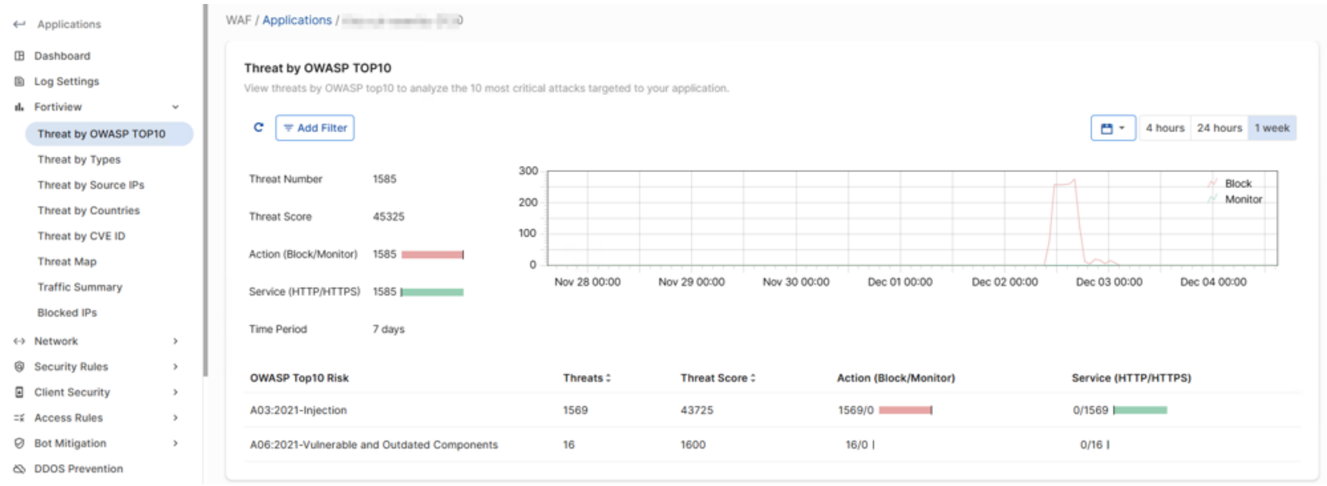
Threat Category	Threats	Percentage

No Data

Threat Level History — Last 24 hours — Score

FortiView

FortiAppSec Cloud WAF detects attacks to your application and displays the threats in **FortiView**. Navigate to any page within this section to explore detailed information on the available threat categories.



WAF / Applications / [redacted]

Threat by OWASP TOP10

View threats by OWASP top10 to analyze the 10 most critical attacks targeted to your application.

Threat Number	1585
Threat Score	45325
Action (Block/Monitor)	1585
Service (HTTP/HTTPS)	1585
Time Period	7 days

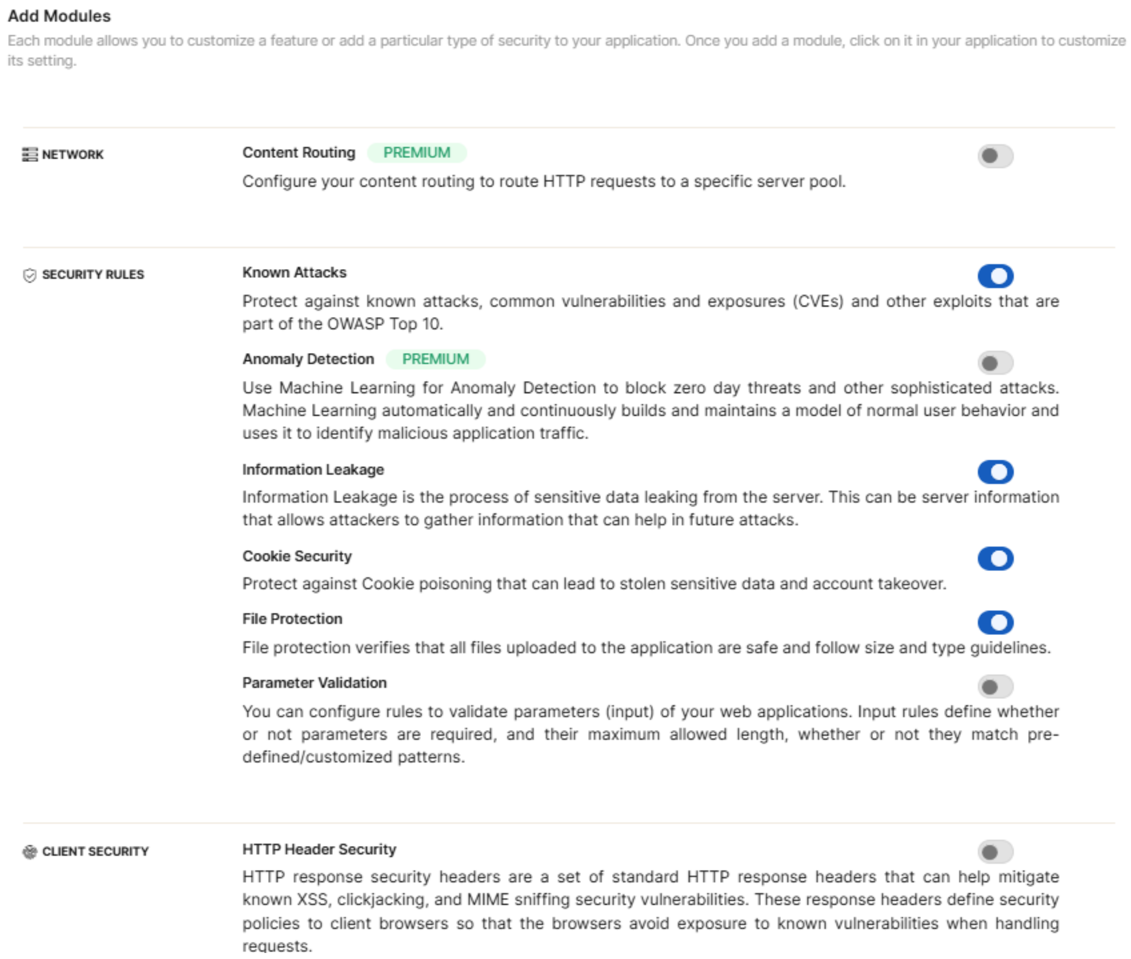
OWASP Top10 Risk	Threats	Threat Score	Action (Block/Monitor)	Service (HTTP/HTTPS)
A03:2021-Injection	1569	43725	1569/0	0/1569
A06:2021-Vulnerable and Outdated Components	16	1600	16/0	0/16

Network

After you complete onboarding applications, you can navigate to the pages under **Network** if you want to change the network settings, or configure advanced settings, such as specifying the SSL certificate for HTTPS connections, adding origin servers, etc.

Modules

Navigate to **Add Module** to enable additional WAF features. Please note that feature availability may vary based on your FortiAppSec Cloud license.



Add Modules

Each module allows you to customize a feature or add a particular type of security to your application. Once you add a module, click on it in your application to customize its setting.

NETWORK

Content Routing PREMIUM ○

Configure your content routing to route HTTP requests to a specific server pool.

SECURITY RULES

Known Attacks ●

Protect against known attacks, common vulnerabilities and exposures (CVEs) and other exploits that are part of the OWASP Top 10.

Anomaly Detection PREMIUM ○

Use Machine Learning for Anomaly Detection to block zero day threats and other sophisticated attacks. Machine Learning automatically and continuously builds and maintains a model of normal user behavior and uses it to identify malicious application traffic.

Information Leakage ●

Information Leakage is the process of sensitive data leaking from the server. This can be server information that allows attackers to gather information that can help in future attacks.

Cookie Security ●

Protect against Cookie poisoning that can lead to stolen sensitive data and account takeover.

File Protection ●

File protection verifies that all files uploaded to the application are safe and follow size and type guidelines.

Parameter Validation ○

You can configure rules to validate parameters (input) of your web applications. Input rules define whether or not parameters are required, and their maximum allowed length, whether or not they match pre-defined/customized patterns.

CLIENT SECURITY

HTTP Header Security ○

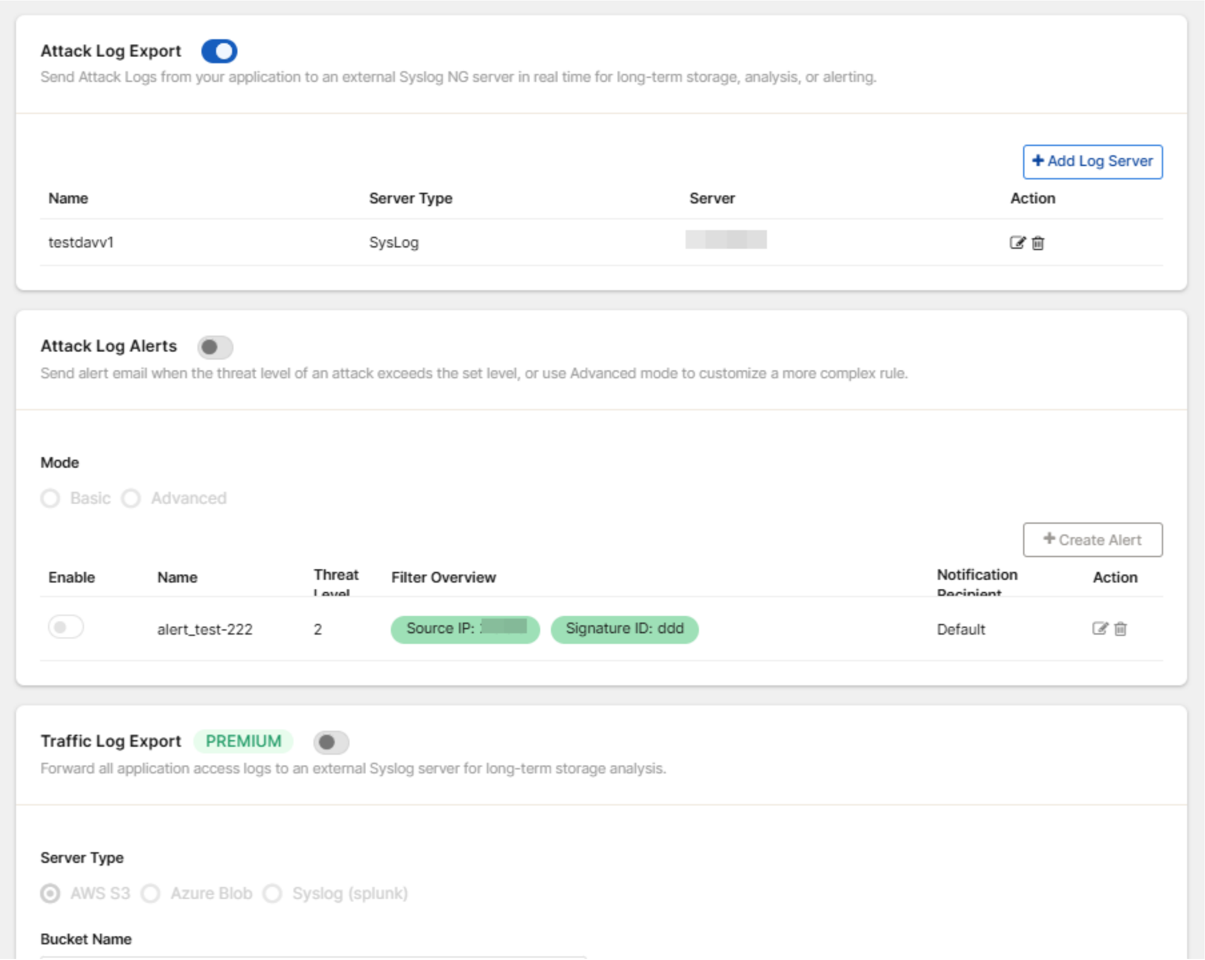
HTTP response security headers are a set of standard HTTP response headers that can help mitigate known XSS, clickjacking, and MIME sniffing security vulnerabilities. These response headers define security policies to client browsers so that the browsers avoid exposure to known vulnerabilities when handling requests.

Vulnerability Scan

The Vulnerability Scan module identifies OWASP Top 10 vulnerabilities in web applications and provides a detailed report with remediation recommendations to enhance security.

Log Settings

Adjust the export, alert, and sensitive data masking settings for your WAF logs.



Attack Log Export

Send Attack Logs from your application to an external Syslog NG server in real time for long-term storage, analysis, or alerting.

Name	Server Type	Server	Action
testdavv1	SysLog	[redacted]	

Attack Log Alerts

Send alert email when the threat level of an attack exceeds the set level, or use Advanced mode to customize a more complex rule.

Mode

○ Basic ○ Advanced

Enable	Name	Threat Level	Filter Overview	Notification Recipient	Action
	alert_test-222	2	Source IP: [redacted] Signature ID: ddd	Default	

Traffic Log Export PREMIUM

Forward all application access logs to an external Syslog server for long-term storage analysis.

Server Type

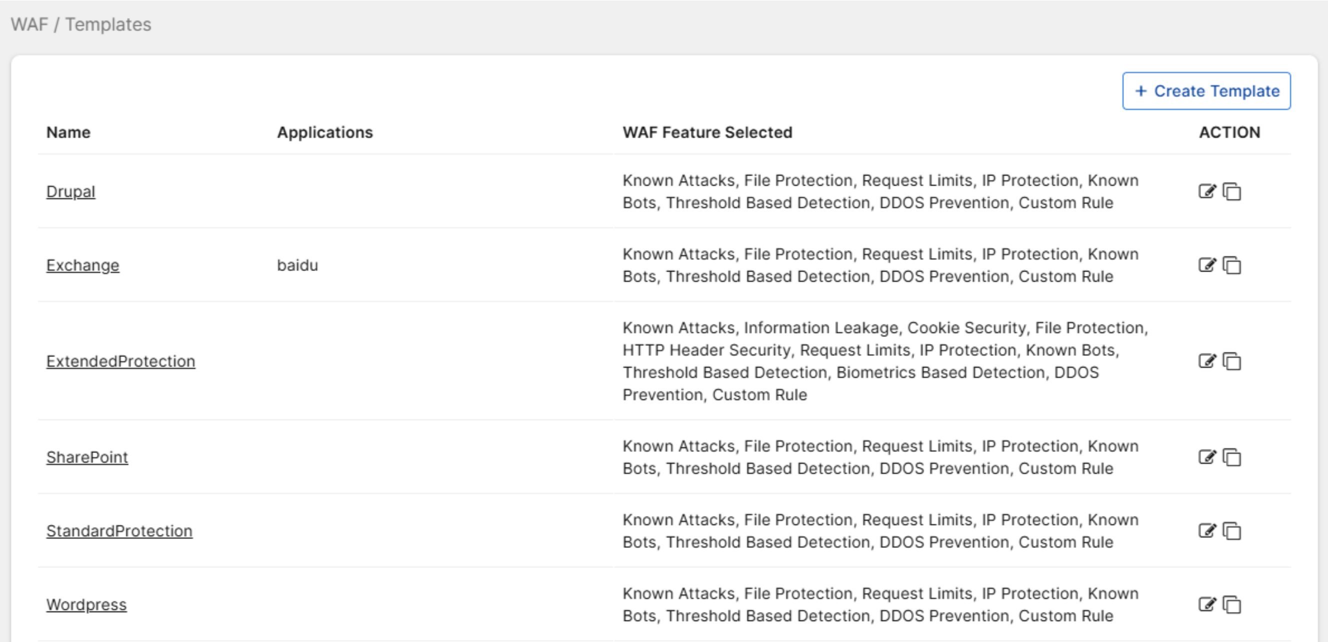
● AWS S3 ○ Azure Blob ○ Syslog (splunk)

Bucket Name

Templates

A template is a collection of pre-defined WAF configurations. Assigning a template to an application automatically applies its WAF configurations to that application.

Templates are ideal if you're unsure which WAF configurations to use, providing a quick and effective way to set up protection. For details, please see Templates on page 159.



Name	Applications	WAF Feature Selected	ACTION
Drupal		Known Attacks, File Protection, Request Limits, IP Protection, Known Bots, Threshold Based Detection, DDOS Prevention, Custom Rule	✎ ⧉
Exchange	baidu	Known Attacks, File Protection, Request Limits, IP Protection, Known Bots, Threshold Based Detection, DDOS Prevention, Custom Rule	✎ ⧉
ExtendedProtection		Known Attacks, Information Leakage, Cookie Security, File Protection, HTTP Header Security, Request Limits, IP Protection, Known Bots, Threshold Based Detection, Biometrics Based Detection, DDOS Prevention, Custom Rule	✎ ⧉
SharePoint		Known Attacks, File Protection, Request Limits, IP Protection, Known Bots, Threshold Based Detection, DDOS Prevention, Custom Rule	✎ ⧉
StandardProtection		Known Attacks, File Protection, Request Limits, IP Protection, Known Bots, Threshold Based Detection, DDOS Prevention, Custom Rule	✎ ⧉
Wordpress		Known Attacks, File Protection, Request Limits, IP Protection, Known Bots, Threshold Based Detection, DDOS Prevention, Custom Rule	✎ ⧉

System Settings

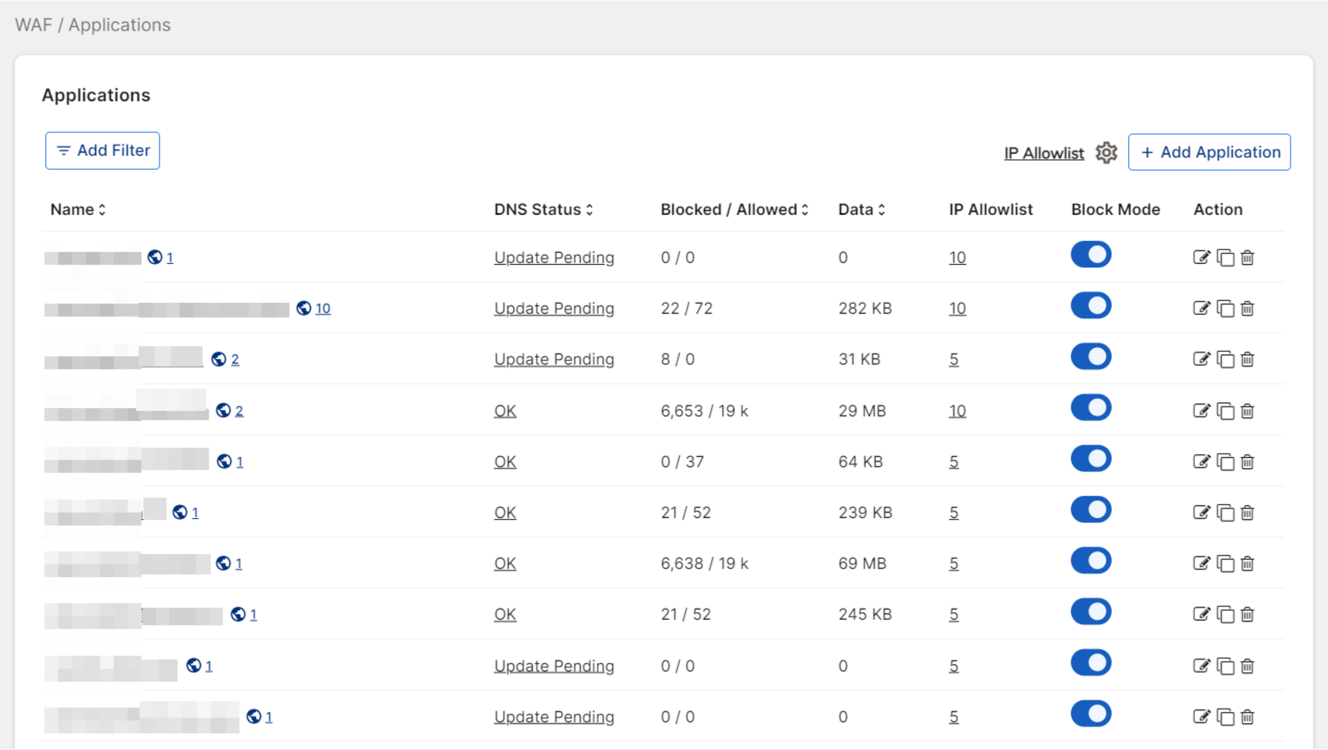
Configure settings that apply to all WAF applications.

WAF Applications

On the Applications page, you can manage configurations related to applications, including viewing application information, filtering applications, onboarding applications, enabling/disabling CDN, selecting FortiAppSec Cloud scrubbing centers for your application.

- Viewing application information
- Onboarding applications
- Cloning the application configurations
- Enabling/disabling CDN
- Selecting FortiAppSec Cloud scrubbing center

Viewing application information



WAF / Applications

Applications

Name	DNS Status	Blocked / Allowed	Data	IP Allowlist	Block Mode	Action
[redacted] 1	Update Pending	0 / 0	0	10	●	✎ ⧉ 🗑
[redacted] 10	Update Pending	22 / 72	282 KB	10	●	✎ ⧉ 🗑
[redacted] 2	Update Pending	8 / 0	31 KB	5	●	✎ ⧉ 🗑
[redacted] 2	OK	6,653 / 19 k	29 MB	10	●	✎ ⧉ 🗑
[redacted] 1	OK	0 / 37	64 KB	5	●	✎ ⧉ 🗑
[redacted] 1	OK	21 / 52	239 KB	5	●	✎ ⧉ 🗑
[redacted] 1	OK	6,638 / 19 k	69 MB	5	●	✎ ⧉ 🗑
[redacted] 1	OK	21 / 52	245 KB	5	●	✎ ⧉ 🗑
[redacted] 1	Update Pending	0 / 0	0	5	●	✎ ⧉ 🗑
[redacted] 1	Update Pending	0 / 0	0	5	●	✎ ⧉ 🗑

The application table displays all the applications you have onboarded. You can view the following information about an application. Click **Add Filter** to create a filter based on Application table fields. Click the **Column Settings** icon ⚙ to select the columns being displayed in the table.

Domain Name	The domain name of the application. If you have added more than one domain name, click the number mark to view all the domain name. You can change the domain names in **Network > Endpoints**.
Platform	The platform where the FortiAppSec Cloud scrubbing center assigned to your application is located. You can click the edit icon ✎ to change the region.
Region	The FortiAppSec Cloud scrubbing center assigned to your application.
DNS Status	It shows **OK** if you have changed the DNS record to use the CNAME IP address provided by FortiAppSec Cloud. Refer to Example: Changing DNS records on AWS Route 53 on page 24.
Blocked / Allowed	The ratio of blocked to allowed requests. **Blocked Requests:** number of requests blocked by FortiAppSec Cloud **Allowed Requests:** The number of requests that reached your application. To view the details, click the application name, then go to **Logs > Attack Logs**.
Data	The volume of data processed by FortiAppSec Cloud, including the data accumulated by the blocked requests.

Block Mode	Enable or disable the block mode. Refer to Understanding block mode and action on page 40

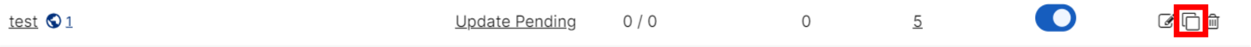
Onboarding applications

See Onboarding WAF applications on page 19 for instructions on how to onboard applications.

Cloning the application configurations

You can create a new template by cloning an existing application's configuration.

1. Click the **Clone** icon on the application row.



test 1 Update Pending 0 / 0 0 5

2. Enter a name for the template.
3. Click OK.

The template will be displayed in **WAF > Templates**.

Enabling/disabling CDN

Enable or disable CDN. For more information, refer to CDN on page 38

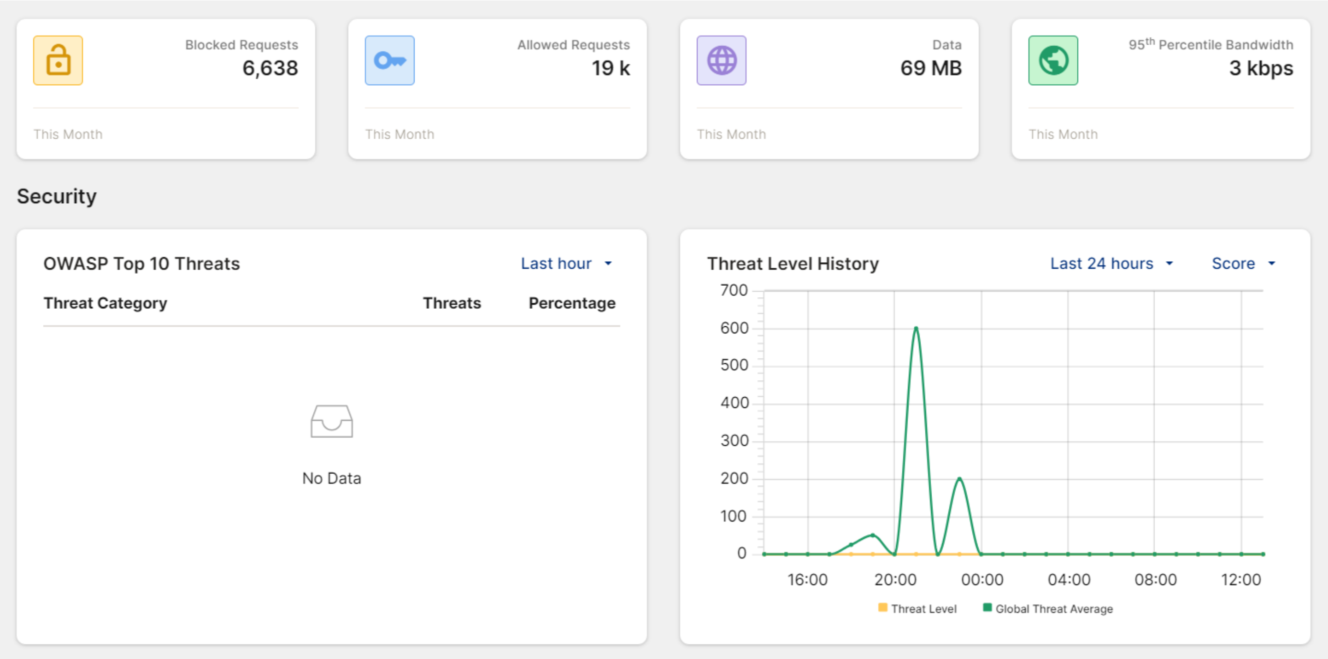
Selecting FortiAppSec Cloud scrubbing center

If CDN is disabled, the system automatically assigns a FortiAppSec Cloud scrubbing center located nearest to your application server. You can change it to another scrubbing center.

1. Go to **WAF > Applications**.
2. Click the edit icon for the application.
3. Select the desired region.
4. Click **OK**.

WAF Application Dashboard

This dashboard displays general security insights from the WAF service.



Blocked Requests 6,638 This Month

Allowed Requests 19 k This Month

Data 69 MB This Month

95th Percentile Bandwidth 3 kbps This Month

Security

OWASP Top 10 Threats

Threat Category	Threats	Percentage

No Data

Threat Level History

Please see the table below for a description on each of the widgets displayed on this page.

Widget	Description
Monthly Counts	Shows the total number of the following transactions for the current calendar month: • Blocked Requests • Allowed Requests • Data • 95th Percentile Bandwidth
Security	
OWASP Top 10 Threats	The OWASP Top 10 risk(s) observed in your application traffic. The OWASP Top 10 is a list of the most critical security risks to web applications, published by the Open Web Application Security Project (OWASP).
Threat Level History	This graph shows the Threat Level of your application traffic over the adjustable time frame (default = last 24 hours). You can adjust the time frame, and choose to view the Threat Level (y-axis) as either a score (0-700) or a percentage. Attacks are assigned a score based on its severity: • Critical: 50 • High: 30 • Medium: 10 • Low: 5 The system calculates a **threat score** every 5 minutes by aggregating attack scores based on their severity.

Widget	Description
	For instance, if there are two critical attacks (score of 50 each) and one high-level attack (score of 30) within this timeframe, the total threat score is calculated as 50*2+30=130. **Threat Scores** and their corresponding severity levels: • 1 (low) • 100 (medium) • 400 (high) • 700 (critical)
Threat Level	The threat level in the last hour on a scale from **low** to **critical**, followed by an ordered table with more information on the detected threats.
Incidents	A line graph displaying the number of incidents falling under **low**, **moderate**, and **high** threat levels over the adjustable time frame (default = last hour).
Top Incidents by Severity	A ranked list of incidents from the selected time frame (default: last hour), ordered by their threat level, starting with the highest. To view additional details, click on an incident in the list.
Top Known Threats	A ranked list of threats from the selected time frame (default: last hour), ordered by their threat level, starting with the highest. To view additional details, click on an incident in the list.
Vulnerability Scan	Insights from Vulnerability Scan.
Traffic	
Throughput	A line chart displaying the level of throughput of **HTTP**, **HTTPS**, and **Cached** traffic.
Incoming Requests	A line chart displaying **blocked**, **allowed**, and **cached** incoming requests.
Traffic Statistics by Country	A world map that highlights the countries with the highest traffic.
Other	
Server Status	Displays the numbers of servers that are **Active**, **Out of Service**, and **Disabled** with a condensed list of all servers. Click **All Servers** to navigate to **Origin Servers on page 68**.
Subscription Services	Lists the WAF services available to you based on your license tier, along with their expiration date and status.

FortiView

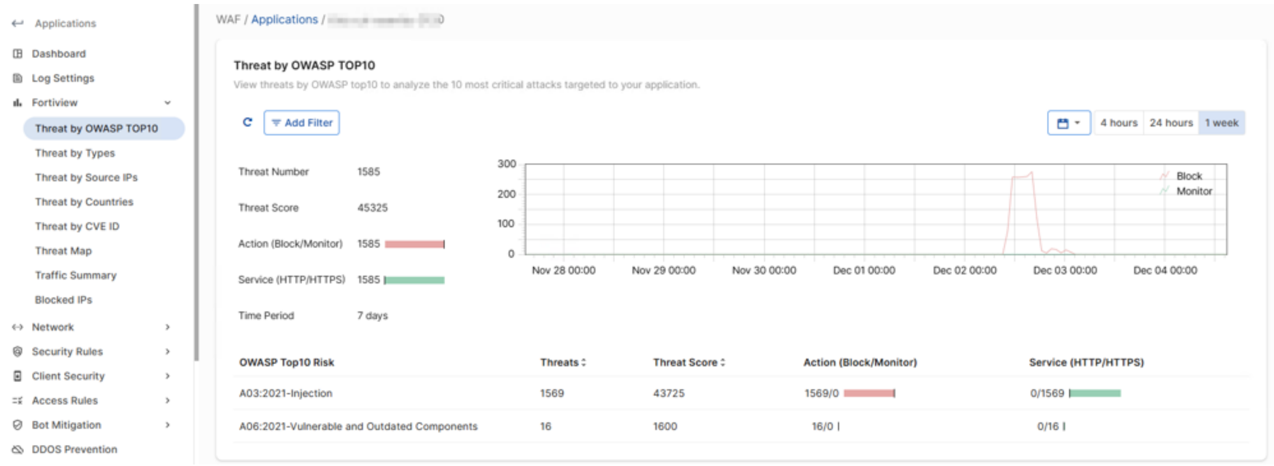
FortiAppSec Cloud detects attacks to your application and displays the threats in FortiView in the following categories:

- **Threat by OWASP TOP10:** Displays threats by OWASP top10 to analyze the 10 most critical attacks targeted to your application.
- **Threats by Types:** Displays threats in specific types, such as Known Attacks, Information Leakage, etc.
- **Blocked IPs:** Displays IP addresses that have been blocked for security reasons, either by your application's security policy or by actions triggered by other applications that caused the load balancers to block them. See detailed instructions to Review and release blocked IP addresses on page 52 below.
- **Threat by Source IPs:** Displays threats by source IP to provide a deep insight in the IP addresses from which attacks originate.
- **Threats by Countries:** Displays threats by countries in which attacks originate.
- **Threat Map:** Displays threats by geographic region. You can see a global map that shows threats in real-time from specific countries.
- **Traffic Summary**: Displays traffic statistics such as source IP addresses, URL, User Agent, Return Code, and Request Method.

You can see the overview of the threats, such as the total number of threats, threat scores, the types of actions FortiAppSec CloudWAF carries out in response to specific types of attacks, and how severe attacks are.

Choose the way you would like to view application threat data:

- Table View



WAF / Applications / [redacted]

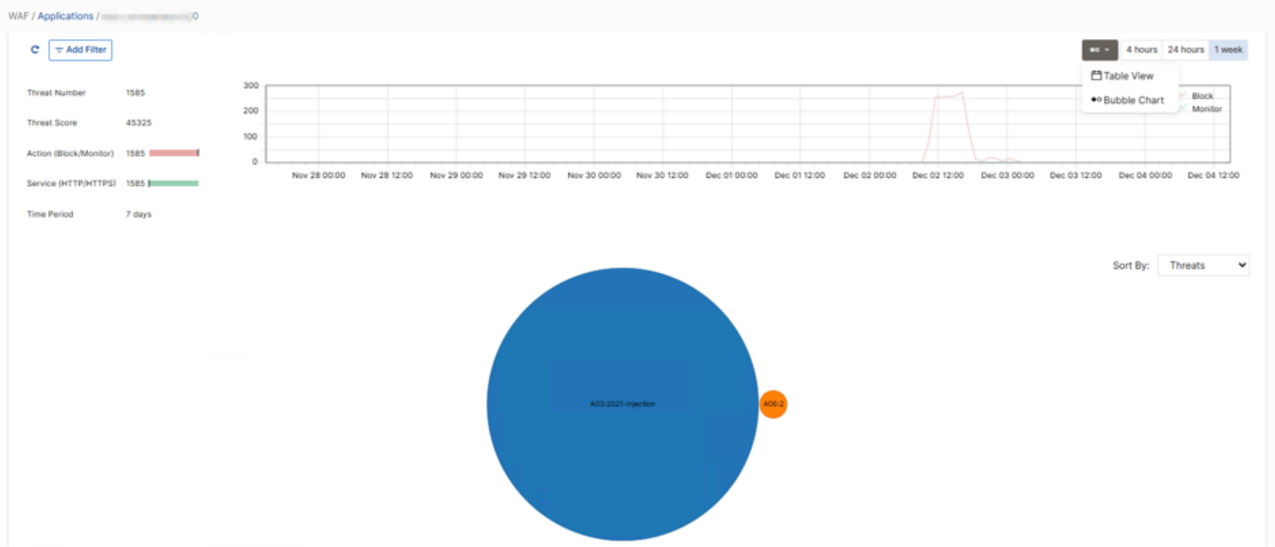
Threat by OWASP TOP10

View threats by OWASP top10 to analyze the 10 most critical attacks targeted to your application.

Threat Number	1585
Threat Score	45325
Action (Block/Monitor)	1585
Service (HTTP/HTTPS)	1585
Time Period	7 days

OWASP Top10 Risk	Threats ↕	Threat Score ↕	Action (Block/Monitor)	Service (HTTP/HTTPS)
A03:2021-Injection	1569	43725	1569/0	0/1569
A06:2021-Vulnerable and Outdated Components	16	1600	16/0	0/16

- Bubble Chart



Threat Number 1585

Threat Score 45325

Action (Block/Monitor) 1585

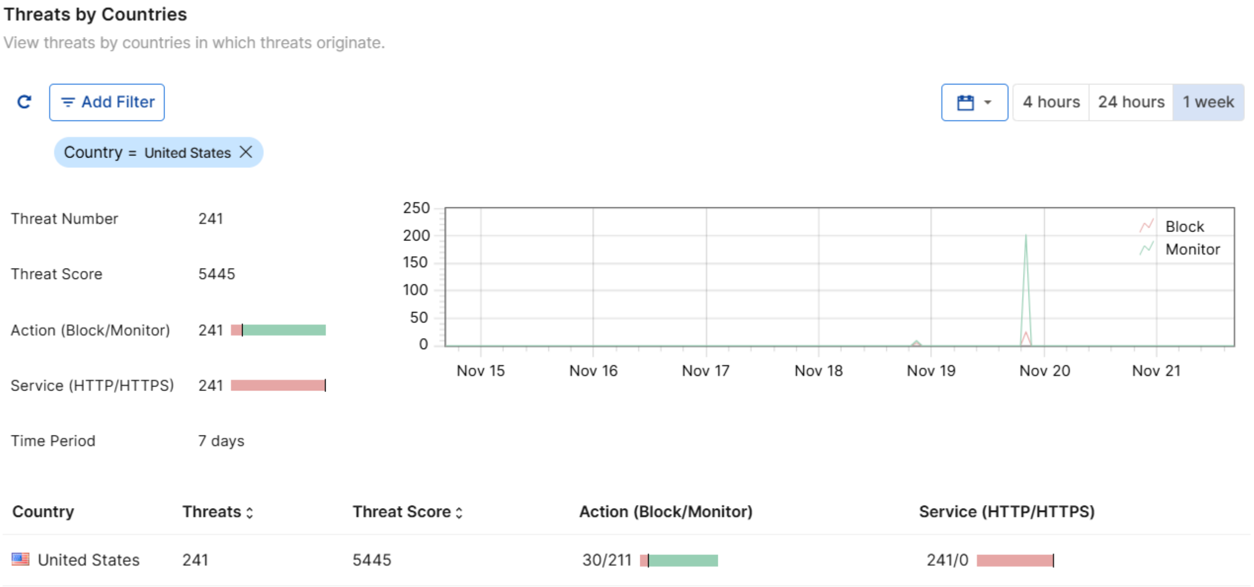
Service (HTTP/HTTPS) 1585

Time Period 7 days

You can also drill down from a high-level overview to a detailed analysis of particular threat. Below is an example using the **Threats by Countries** menu to illustrate how the filtering and drilling down process works.

To view the detailed analysis of a particular threat:

1. Go to **FortiView Threat View > Threats by Countries**.
2. Click **Add Filter**, select **Country**, and either enter the name of the country or select the country from the drop-down menu. In this case, United States is selected.



Threats by Countries

View threats by countries in which threats originate.

Country = United States

Threat Number 241

Threat Score 5445

Action (Block/Monitor) 241

Service (HTTP/HTTPS) 241

Time Period 7 days

Country	Threats	Threat Score	Action (Block/Monitor)	Service (HTTP/HTTPS)
United States	241	5445	30/211	241/0

3. Double-click the country row to view a summary of the threat data from this country.
4. Select tabs to view the threat data categorized by **Threats**, **Sources**, **HTTP Methods**, **URLs**, **CVE ID**, and **OWASP Top10**.
5. If you know that certain URL tends to falsely trigger violations by matching an attack signature during normal use, you can click **Add Exception** beside the signature ID. The traffic to that URL will not be treated as an attack even if

it matches this particular signature.

Please note that the number of attacks displayed in Attack Logs, FortiView , and Blocked Requests widget on Dashboard are slightly different.

- Certain attack types such as Bot and DDoS attacks generate a large amount of requests in a short time. To prevent numerous identical attack logs flooding the UI, FortiAppSec Cloud only logs the first request in Attack Logs and FortiView , while it shows the actual count in Blocked Requests Widget so you can know how many actual attack requests were blocked.
- To prevent Information Leakage, FortiAppSec Cloud may cloak the error pages or erase sensitive HTTP headers in response packets. Such items are logged only once per minute in Attack Logs and FortiView for you to know the Information Leakage rule took effect. In the meanwhile, the actual count is recorded in Blocked Requests Widget.
- If you have set FortiAppSec Cloud to block attacks but do not generate a log when certain violation occurs, such as Deny(no log), then the attacks will not be logged in Attack Logs and FortiView , but will be counted in the Blocked Requests widget.

Review and release blocked IP addresses

Navigate to **FortiView > Blocked IPs** to see a list of IP addresses that have been blocked by FortiAppSec Cloud, either by your application's security rules or by actions triggered by other applications that caused the load balancers to block them.

When searching for a specific IP address on this list, you can click **Add Filter** to narrow down the number of IP addresses displayed on this page.

To remove an item from this list, click on the delete icon in the same row as the desired IP address to effectively unblock it.

Log Settings

This page includes configuration information for attack logs and traffic logs. For information on audit logs, please see Audit Logs Export on page 354.

Exporting attack logs

To export the attack logs to a log server:

1. Go to **Log Settings**.
2. Enable **Attack Log Export**.
3. Click **Add Log Server**.
4. Configure the following settings.

Name	Enter a name for the log server.
Server Type	Select whether to export the logs to a log server, an ElasticSearch service, FortiAnalyzer, or FortiSIEM.

	See the following instructions for SysLog, ElasticSearch, FortiAnalyzer, and FortiSIEM
SysLog	
IP/Domain and Port	Enter the IP/Domain and Port of the log server.
Protocol	Select the protocol used for log transfer.
Server Certificate Verification	When enabled, the system will enforces server certificate verification before it sends attack logs to the log server.
Custom Certificate and Key	• **Off:** FortiAppSec Cloud automatically retrieves the SSL certificate used to encrypt the HTTPS connections between the log server and FortiAppSec Cloud. • **On:** Manually enter the SSL certificate. Available only if you select **SSL** in **Protocol**.
Client Certificate	Fill in the Certificate field. Available only if you enabled **Custom Certificate and Key**.
Private Key	Fill in the Private Key field. Available only if you enabled **Custom Certificate and Key**.
Password	Enter the password of the private key. Available only if you enabled **Custom Certificate and Key**.
Log Format	• **Default:** Export logs in default format. • **Custom:** Customize the log format. All the supported parameters are listed by default. You can select the ones that you need, and delete the others. • **Splunk:** Export logs to Splunk log server. • **CEF:0 (ArcSight):** Export logs in CEF:0 format. • **Microsoft Azure OMS:** Export logs in Microsoft Azure OMS format. • **LEEF1.0(QRadar):** Export logs in LEEF1.0 format.
Log Severity	Select the severity level of the logs. All the exported logs will be attached with the selected severity level.
Log Facility	Select the source facility of the logs. We only support the local use facilities which are not reserved and are available for general use.
ElasticSearch ElasticSearch is a search engine providing a distributed, multitenant-capable full-text search engine with an HTTP web interface and schema-free JSON documents.	
Address and Port	Enter the address and port to access your ElasticSearch service. The default port for ElasticSearch service is 9200.
User Name	Enter the user name of the ElasticSearch service.
Password	Enter the password of the ElasticSearch service user.
FortiAnalyzer	

FortiAnalyzer is a powerful log management, analytics, and reporting platform that provides centralized logging and analysis, plus end-to-end visibility. *Please note that while FortiAnalyzer is supported, FortiAnalyzer Cloud is not.	
IP/Domain and Port	Enter the IP/Domain and Port of the log server.
Protocol	Select the protocol used for log transfer.
Server Certificate Verification	When enabled, the system will enforces server certificate verification before it sends attack logs to the log server.
Log Format Preview	This box shows a preview of the log format, and is not editable.
Log Severity	Select the severity level of the logs. All the exported logs will be attached with the selected severity level.
Log Facility	Select the source facility of the logs. We only support the local use facilities which are not reserved and are available for general use.
FortiSIEM	
IP/Domain and Port	Enter the IP/Domain and Port of the log server.
Protocol	Select the protocol used for log transfer.
Server Certificate Verification	When enabled, the system will enforces server certificate verification before it sends attack logs to the log server.
Log Format Preview	This box shows a preview of the log format, and is not editable.
Log Severity	Select the severity level of the logs. All the exported logs will be attached with the selected severity level.
Log Facility	Select the source facility of the logs. We only support the local use facilities which are not reserved and are available for general use.

5. Click **OK**. The system exports newly generated attack logs to the log server every minute.

To prevent log poisoning, it's recommended to set filters on your log server to allow only the traffic from FortiAppSec Cloud. The source IPs are as follows:

- 3.226.2.163
- 3.123.68.65

Configuring attack log alert

FortiAppSec Cloud monitors the attack logs every five minutes, and sends alert email based on the set threat level. You can also customize a more complex rule for the alert email.

To configure an attack log alert:

1. Go to **Log Settings**.
2. Enable **Attack Log Alerts**.

3. For **Mode**, when you select **Basic**, configure the following settings

Threat Level	The attacks of different threat levels are marked with the following values: • Critical: 50 • High: 30 • Medium: 10 • Low: 5 The system counts the threat score every 5 minutes. For example, if there are 2 critical attacks and 1 high threat level attack in 5 minutes, the threat score is 50*2+30=130. **Basic** In basic mode, an alert email will be sent if the threat score is accumulated higher than the following value in 5 minutes: • 1 (low) • 100 (medium) • 400 (high) • 700 (critical) For example, if you set the **Threat Level** to medium, and the threat score is 130, then an alert email will be sent.
Notification Recipient	• **Default**—The alert email will be sent to the email address that is used to register your account. • **Custom**—Specify the email addresses to receive the alert.
Custom Recipient	Enter the email addresses. Separate multiple email addresses with ",". Available only if you select Custom for Notification Recipient.

4. For **Mode**, when you select **Advanced**, click **+Create Alert** to customize a more complex rule. You can create at most two rules.
5. Configure the following settings.

Name	Enter a name for the alert rule.
Threat Score	Specify a threat score for the attack log. The attacks of different threat levels are marked with the following values: • Critical: 50 • High: 30 • Medium: 10 • Low: 5 The system counts the threat score every 5 minutes. For example, if there are 2 critical attacks and 1 high threat level attack in 5 minutes, the threat score is 50*2+30=130. If the actual threat score is higher than the score value you set, an alert email will be sent.
Notification Recipient	• **Default**—The alert email will be sent to the email address that is used to register your account. • **Custom**—Specify the email addresses to receive the alert.
Custom Recipient	Enter the email addresses. Separate multiple email addresses with ",". Available only if you select Custom for Notification Recipient.

6. For **Filter Overview**, click **Add Filter** to create a filter based on attack log messages. Only messages that match the criteria in the filter will be calculated on the threat score.

7. Click **OK**.

Exporting traffic logs

Traffic logs record traffic events such as HTTP requests and responses, and the expiration of HTTP sessions. FortiAppSec Cloud's Web UI doesn't show traffic logs, but you can export traffic logs to AWS S3 or Azure Blob bucket in real time for long-term storage, analysis, or alerting.

Please note that at this time, FortiAppSec Cloud does not support exporting traffic logs to OCI (Oracle Cloud Infrastructure).

1. Go to **Log Settings**.
2. Enable **Traffic Log Export**.
3. Configure the following settings.

Server Type	Select whether to export the logs to AWS S3 or Azure Blob.
AWS S3	
Bucket name	Enter the AWS S3 bucket name.
Region	Enter the region code, for example, ap-southeast-1.
Access Key ID	Enter the access key ID of the S3 bucket.
Secret Key ID	Enter the secret key ID of the S3 bucket.
Folder	Enter the folder to store the traffic log.
Azure Blob	
Storage Account Name	Enter the Azure Blob storage account name
Account Access Key	Enter the Account Access Key for your storage account.
Container Name	Enter the name of the blob container to which you would like to export your traffic logs.

4. Click **Save**.

To prevent log poisoning, it's recommended to set filters on your S3 bucket to allow only the traffic from FortiAppSec Cloud. The source IPs from FortiAppSec Cloud are as follows:

- 3.226.2.163
- 3.123.68.65

We also recommend adding the source IP addresses of traffic log exporting centers into the filter, corresponding to the region of your application.

AWS:

ap-east-1: Asia Pacific (Hong Kong)	16.162.29.183
ap-south-1: Asia Pacific (Mumbai)	15.207.118.191
ap-southeast.prod: Asia Pacific (Singapore)	18.142.59.230
ap-southeast-2: Asia Pacific (Sydney)	13.238.126.108
ca-central-1: Canada (Central)	52.60.181.20
eu-central-1: Europe (Frankfurt)	3.64.92.136 3.79.38.161
eu-west-1: Europe (Ireland)	54.220.37.1
eu-west-2: Europe (London)	18.171.94.215
eu-west-3: Europe (Paris)	15.237.205.81
eu-south-1: Europe (Milan)	35.152.101.76
il-central-1: AWS Israel (Tel Aviv)	51.17.180.108
sa-east-1:L South America (Sao Paulo)	15.229.167.39
us-east-1: US East (N.Virginia)	44.215.25.31 44.216.53.179
us-east-2: US East (Ohio)	3.19.8.134
us-west-1: US West (N. California)	54.177.53.242

us-west-2: US West (Oregon)	34.208.62.10

Azure:

Australia East	20.188.247.221
Brazil South (São Paulo State)	191.234.179.164
Canada Central	52.237.13.214
East US	52.191.198.64
East US 2	20.10.187.167
West Europe	20.73.191.71
West US 2	40.125.64.146

Google Cloud:

europe-west3 (Frankfurt)	35.242.250.207
europe-west8 (Milan)	34.154.63.237
me-west1 (Tel Aviv)	34.165.47.110
us-east1 (South Carolina)	34.74.77.198
us-west1 (Oregon)	34.127.22.16

Sensitive Data Masking

Configure **Sensitive Data Masking** as part of **Log Settings** to mask information deemed sensitive in log message fields, such as passwords or credit card numbers. The **Sensitive Data Masking** settings are applied at the application level, with each application able to support up to 8 sensitive data rules.

To create a sensitive data rule:

1. Go to **Log Settings**.
2. Enable **Sensitive Data Masking**.
3. Click **+Sensitive Data Rule**.

4. Configure the following settings.

Type	Select the type of data the rule will apply to. • **URL** • **Cookie** • **Parameter** • **Header**
Name	Type a regular expression that matches all and only the input names whose values you want to obscure. To create a regular expression, see Frequently used regular expressions on page 177. This field is not required if **URL** data type is selected.
Value	Type a regular expression that matches all and only input values that you want to obscure. To create a regular expression, see Frequently used regular expressions on page 177.

5. Click **OK**.

Retention and Periodic clean

All logs are periodically cleaned at the beginning of each month.

Please see table below for the retention information on each type of log:

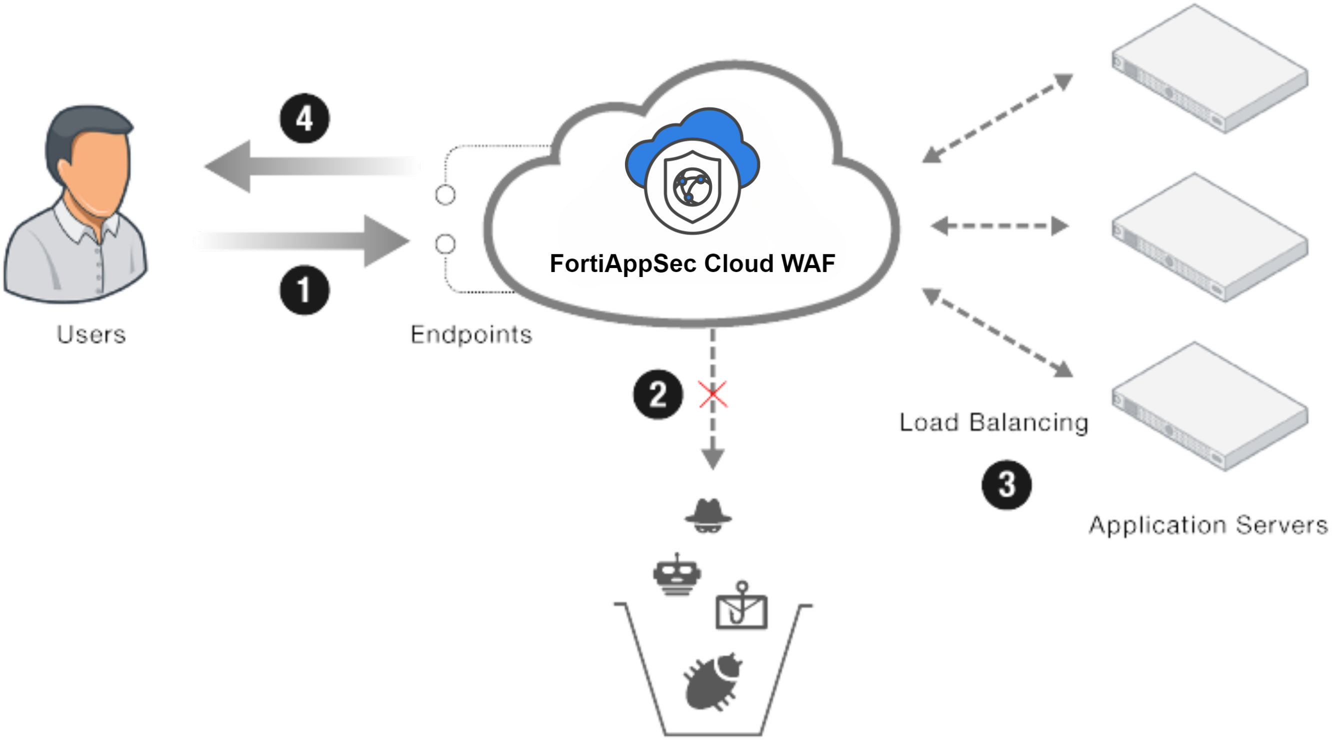
Category	Features	Retention
Incident	Dashboard - Incidents	90 days
	Dashboard - Top Incidents by Severity	
	Threat Analytics - Incidents	
Attack log	Threat Analytics -Attack log	60 days
	FortiViewThreatView	
	Dashboard - OWASP Top 10 Threats	
	Dashboard - Threat Level History	
	Dashboard - Top Known Threats	
Traffic log	Dashboard - Traffic Statistics by Country	60 days
	Traffic Summary	
Audit log	Audit log	60 days
On-Premise Device Attack log	Threat Analytics - Attack log (on-premise device only)	90 days

Network

After you complete onboarding, you can navigate to the pages under **Network** if you want to change the network settings, or configure advanced settings, such as specifying the SSL certificate for HTTPS connections, adding origin servers, etc.

- Endpoints
- Origin Servers

Before setting up the network, it is helpful to understand the traffic flow between the clients, FortiAppSec Cloud WAF, and origin servers.



The figure above illustrates the following points:

1. When users visit your application, the traffic is directed to the endpoints on FortiAppSec Cloud.
2. FortiAppSec Cloud WAF filters the incoming traffic from users, blocking the OWASP Top 10 attacks, zero day threats, and other application layer attacks.
3. Legitimate traffic arrives at origin servers. Load balancing algorithm is used to distribute traffic among servers.
4. When FortiAppSec Cloud sends responses to your users, it obfuscates sensitive data such as the credit card number and other information that are likely to be used by hackers to damage your business.

Endpoints

Define the types of traffic allowed to access your application, such as HTTP or HTTPS, the specific TLS protocol versions supported, and the preferred cipher strengths.

Endpoint Configuration

List the domains to protect. The protection policy configured for this application applies to all the domains.

- You can add up to 10 domains. They should belong to the same root domain, such as www.example.com and mail.example.com.
- Wildcard is supported except the first entry in the list. Make sure that the domain name entries do not overlap, for example, “www.example.com” can't be added together with “*.example.com” . The wildcard only matches with the string within the same domain level, for example, "a.example.com" matches with “*.example.com”, while "a.a.example.com" doesn't.
- Once the application is onboarded, you are not allowed to change the first domain. Highly recommend to use root domain for the first domain, e.g. example.com or www.example.com.

Select HTTP, HTTPS, HTTP/2, or IPv6 to define the traffic types allowed to arrive at the domains of your application.

Field	Description
Endpoint CNAME	This field is autopopulated from your DNS configuration, and is not editable.
Domain	List the domains to protect. The protection policy configured for this application applies to all the domains. • Please enter the root domain as the first entry. • You can add up to 10 domains. They should belong to the same root domain, such as www.example.com and mail.example.com. • Wildcard is supported, except for the first domain entry. Make sure that the domain name entries do not overlap, for example, “www.example.com” can't be added together with “*.example.com” . The wildcard only matches with the string within the same domain level, for example, "a.example.com" matches with “*.example.com”, while "a.a.example.com" doesn't. • Once the application is onboarded, you are not allowed to change the first domain. Highly recommend to use root domain for the first domain, e.g. example.com or www.example.com.
HTTP	Enable to allow HTTP traffic, and select the port number for HTTP service.
HTTPS	Enable to allow HTTPS traffic. If HTTPS is allowed, you will be required to configure the **SSL/TLS Certificate Management** and **TLS and Cipher Configuration**. The default value for HTTPS is 443. See below for the list of all accepted HTTPS configuration options. Make sure the port numbers for HTTP and HTTPS are not duplicate.

FortiAppSec Cloud uses the following ports for HTTP and HTTPS services. These ports are open on FortiAppSec Cloud scrubbing center clusters. There are no security concerns because if the port is not set as the service port for your application, any request to this port for the application will be rejected.

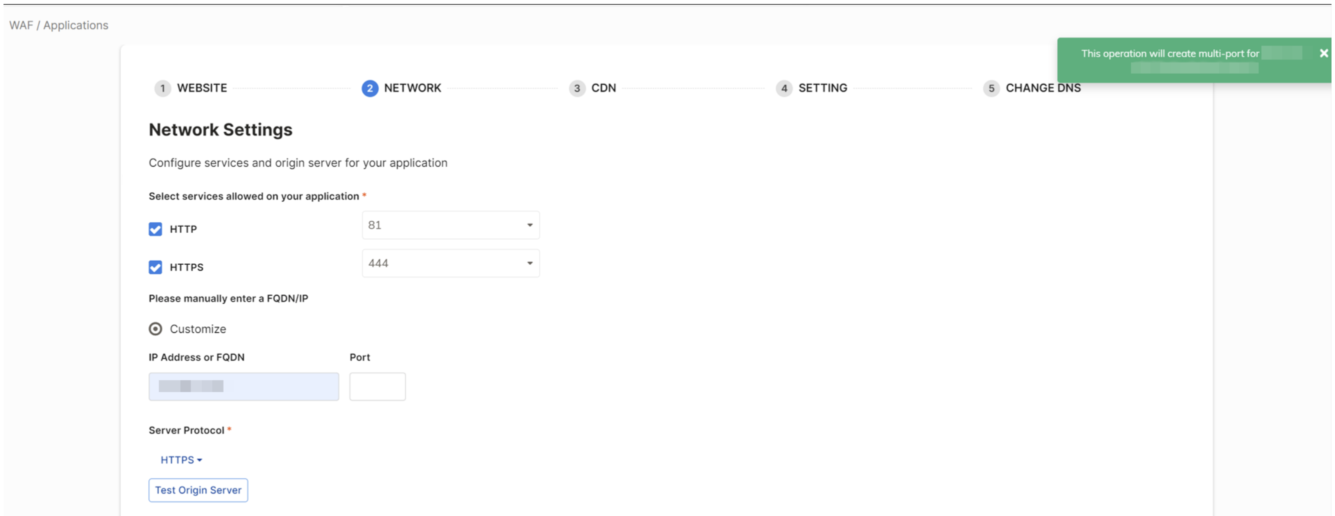
- HTTP: 80, 81, 1601, 1701, 3881, 3883, 5020, 8000, 8014, 8069, 8080, 8087, 8888, 9003, 9013, 9080, 9091, 9092, 9219, 9991, 10082, and 10083
- HTTPS: 85, 86, 443, 444, 445, 452, 491, 1443, 1760, 1988, 1989, 2001, 2087, 2096, 3000, 3001, 3002, 4000, 4201, 4333, 4334, 4430, 4440, 4443, 4466, 4993, 5000, 5001, 5021, 5055, 5454, 5501, 7003, 7443, 7503, 7741, 7989, 8002, 8010, 8011, 8012, 8015, 8016, 8020, 8021, 8022, 8023, 8025, 8027, 8033, 8034, 8039, 8040, 8043, 8044, 8048, 8051, 8052, 8053, 8055, 8056, 8057, 8058, 8059, 8060, 8065, 8070, 8071, 8072, 8075, 8076, 8077, 8078, 8079, 8081, 8082, 8084, 8085, 8086, 8088, 8090, 8092, 8093, 8094, 8095, 8096, 8097, 8098, 8099, 8104, 8109, 8113, 8181, 8282, 8383, 8443, 8444, 8448, 8585, 8723, 8787, 8801, 8866, 8881, 9052, 9090, 9093, 9111, 9123, 9193, 9440, 9443, 9449, 9452, 9797, 9999, 17989, 27989, 28818, 44300, 44301, 44302, 44304, 44395, 44443, 52233, 55180, 55553, and 60000

If the HTTP and HTTPS port number you want to use is not in the list, please contact FortiAppSec Cloud Support or your sales engineer to customize the port number. Notice not all non-standard ports can be used, and HTTP and HTTPS services must use different ports.

Multi-port

Multi-port applications allow you to direct traffic on your application across multiple HTTP or HTTPS ports. To enable multi-port functionality, create multiple applications with the same domain. For instructions on creating applications, see Onboarding WAF applications on page 19.

When FortiAppSec Cloud detects multiple applications with the same domain, you will encounter a pop message in the top-right corner of your window when you click **Test Origin Server** on the **Network** tab. This indicates you are creating a multi-port application.



WAF / Applications

This operation will create multi-port for [redacted]

1 WEBSITE — 2 NETWORK — 3 CDN — 4 SETTING — 5 CHANGE DNS

Network Settings

Configure services and origin server for your application

Select services allowed on your application *

☑ HTTP 81

☑ HTTPS 444

Please manually enter a FQDN/IP

● Customize

IP Address or FQDN: [redacted]

Port:

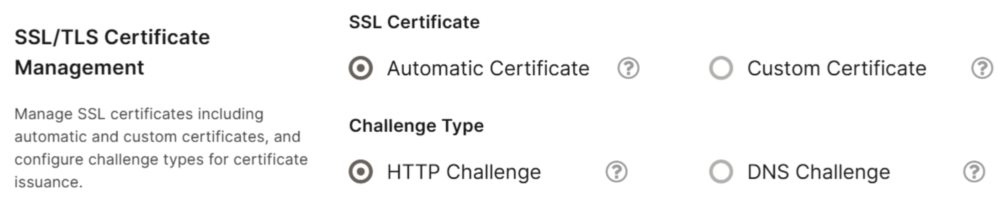
Server Protocol *: HTTPS

When configuring a multi-port application, please note the following:

- You cannot change the region/CDN while multi-port is enabled.
  - To switch regions or CDNs, delete all multi-port applications of a domain, leaving only the original application. After changing the region, you will need to manually recreate the multi-port applications to resume traffic from other ports.
- If you need to use a custom certificate on an application, please re-input the certificate for each multi-port.
- Ensure that the first domain on the multi-port is the same as the first domain on the original application. This ensures that FortiAppSec Cloud will recognize the duplicate as a multi-port application.

- When managing sub-domains with different port requirements, it is best to create them as separate applications. This approach ensures each sub-domain can independently manage its specific port settings without overlapping configurations.

SSL/TLS Certificate Management



SSL/TLS Certificate Management

Manage SSL certificates including automatic and custom certificates, and configure challenge types for certificate issuance.

SSL Certificate

● Automatic Certificate ○ Custom Certificate

Challenge Type

● HTTP Challenge ○ DNS Challenge

SSL Certificate

The SSL certificate is used to encrypt the HTTPS connections between users and FortiAppSec Cloud. Without a valid certificate, users will see a certificate invalid warning when they visit your application.

FortiAppSec Cloud will not apply automatic certificate if your application uses AWS CloudFront service.

SSL Certificate Option	Description
Automatic Certificate	By default, FortiAppSec Cloud automatically retrieves SSL certificates from the Certificate Authority Let's Encrypt. If it fails, or if you would like to use your own certificate, you can manually upload it to FortiAppSec Cloud. **Before selecting Automatic Certificate, ensure the following is done:** • Ensure your DNS record is changed to the CNAME or A record shown in the last step of the Web Application Configuration wizard. • If using **HTTP Challenge**, ensure HTTP traffic is enabled and use port 80. The Certificate Authority sends HTTP requests to FortiAppSec Cloud to validate the DNS CNAME record. • You must add "letsencrypt.org" in the CAA value if you have configured a CAA record at your DNS service. For more information, search CAA in FAQ > Network on page 381. • Do not block requests from the United States in **Access Rules > IP Protection > Geo IP Block**, as this will prevent FortiAppSec Cloud from retrieving certificates from Let's Encrypt. • Ensure the server health check status is **OK** before retrieving a certificate. If not, disable the health check temporarily to avoid interruptions during certificate retrieval. Once the certificate is retrieved successfully, re-enable the health check and troubleshoot any server connection issues.

SSL Certificate Option	Description
Custom Certificate	FortiAppSec Cloud may fail to retrieve the certificate for some reasons, for example, the HTTP traffic is not allowed on the endpoints. An exclamation mark will appear beside the **Automatic Certificate** option indicating the certificate fails to be retrieved. In this case, or in case you would like to use your own certificate, you can import SNI certificates or intermediate certificates (optional). **1.** Select **Custom Certificate** on the **Endpoints** page. **2.** For **SNI Certificate**, click **Import** and copy the Private Key and Certificate values provided by your Certificate Authority. FortiAppSec Cloud automatically parses information of the SNI certificates including issuance, expiration, status, and certificate chain, and changes them to recognizable formats. For status, when FortiAppSec Cloud verifies the private key and certificate values are consistent, the status is OK; when FortiAppSec Cloud verifies the certificate has expired, the status is Expired; when FortiAppSec Cloud verifies the certificate is valid, while the certificate chain verification fails, the status is Invalid Chain. FortiAppSec Cloud requires you to import the private key and certificate in separate fields. If you use a PKCS#12 certificate, refer to this article to extract the key and certificate: https://www.ssl.com/how-to/export-certificates-private-key-from-pkcs12-file-with-openssl **3.** For **Intermediate Certificate (optional)**, click **Import** and copy the certificate value provided by your intermediate Certificate Authority. FortiAppSec Cloud automatically parses information of the intermediate certificates including issuance, and expiration, and changes them to recognizable formats. Also, FortiAppSec Cloud verifies the status and certificate chain. When an indeterminate certificate is successfully imported or deleted, FortiAppSec Cloud reverifies the expiration and certificate chain. You can import at most 32 SNI certificates and intermediate certificates respectively. Submit a support ticket if you want to extend the limits. If you have multiple applications with different root domain names but sharing the same IP address, you need to import the certificates for all the domains names. For more information, see Multiple domains sharing the same IP address on page 168.

When adding an application, you can specify only one domain name. However, you have the option to configure up to 10 certificates. Each certificate supports up to 100 additional domains, meaning your application can support up to a total of 1000 domains. Please note that duplicate certificates containing identical domains are not allowed.

To configure additional certificates:

- Go to **Network > Endpoints**
- Click **Add New Certificate**

- Enter the desired domains, separating each one with line breaks. Wildcard is supported for this step.
- Click **OK**. Let's Encrypt will automatically generate certificates for each domain you entered.

Challenge Type

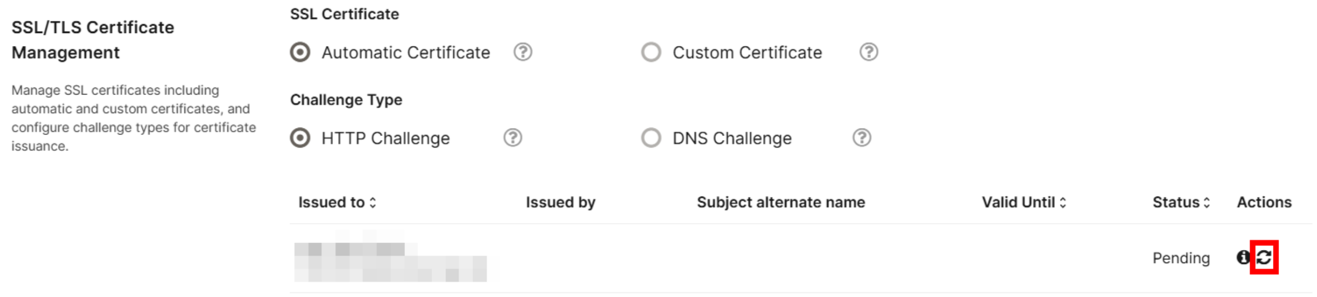
Let's Encrypt sends challenges to validate that you control the domain names you have listed while onboarding the application.

Challenge Type	Description
HTTP Challenge	To pass the challenge, you must change all the DNS entries for the domains you listed.
DNS Challenge	To pass the challenge, you need to create a new CNAME record for automatic certificate as well as change the DNS entries for the domains you listed. To avoid users encounter the "certificate invalid" error, you can first create the CNAME record (beginning with "_acme-challenge") to get the automatic certificate. After DNS status turns to **OK**, which means the certificate is successfully installed, you can then change the DNS records for your application's domains to direct the traffic to FortiAppSec Cloud. Please note that DNS challenge will be used for the wildcard domains regardless which challenge type you have chosen.

The challenge is automatically handled, but if you need to make more complex configuration decisions, it can be helpful to understand the process in more detail. For additional information, please see Challenge Types posted by Let's Encrypt.

Several minutes after the challenge is successfully completed, FortiAppSec Cloud automatically obtains an SSL certificate from Let's Encrypt installs it on your application. It will be used in HTTPS connections to encrypt or decrypt the traffic. If FortiAppSec Cloud fails to retrieve the certificate, it will try again every 12 minutes on the 1st day, then once an hour on the 2nd and 3rd days. After that, the retry frequency reduces to once per day until the certificate is successfully retrieved.

To retrieve the certificate immediately, click the **Refresh** button under the **Actions** column to restore the interval count to the 1st day. FortiAppSec Cloud will then retrieves certificate every 12 minutes, and so on.



SSL/TLS Certificate Management

Manage SSL certificates including automatic and custom certificates, and configure challenge types for certificate issuance.

SSL Certificate

◉ Automatic Certificate ⓘ ○ Custom Certificate ⓘ

Challenge Type

◉ HTTP Challenge ⓘ ○ DNS Challenge ⓘ

Issued to	Issued by	Subject alternate name	Valid Until	Status	Actions
[redacted]				Pending	ℹ ↻

Thirty days before your certificate expires, FortiAppSec Cloud will re-verify that your DNS CNAME record is still correct. If it is, FortiAppSec Cloud automatically renews your certificate for another 90 days, ensuring that it does not expire. This process helps maintain continuous encryption for HTTPS connections without manual intervention.

TLS and Cipher Configuration

Select which versions of SSL or TLS protocols are allowed for the HTTPS connections between FortiAppSec Cloud and the clients.

For a complete list of the ciphers of each Encryption Level, see Supported cipher suites & protocol versions.

Field	Description
SSL/TLS Encryption Level: The HTTPS traffic is encrypted or decrypted with ciphers.	Controls how many ciphers are supported and the settings provide the following options: • **Mozilla-Modern:** For services with clients that support TLS 1.3 and don't need backward compatibility, Mozilla-Modern is the recommended configuration as it provides an extremely high level of security. • **Mozilla-Intermediate:** For services that don't need compatibility with legacy clients such as Windows XP or old versions of OpenSSL, Mozilla-Intermediate is the recommended configuration as it is highly secure and in the meanwhile compatible with nearly every client released in the last five (or more) years. • **Mozilla-Old:** For services accessed by very old clients or libraries, such as Internet Explorer 8 (Windows XP), Java 6, or OpenSSL 0.9.8. Mozilla-old is the recommended configuration as it is compatible with most of the clients. • **Customized:** Select to select options from lists of all available TLS 1.3, 1.2, and 1.1 ciphers below.
TLS 1.3	Enable to allow TLS 1.3.
TLS 1.2	Enable to allow TLS 1.2
TLS 1.1	Enable to allow TLS 1.1
HTTP Strict Transport Security (HSTS)	Enable to combat MITM attacks on HTTP by injecting the RFC 6797 (http://tools.ietf.org/html/rfc6797) strict transport security header into the reply, such as: `Strict-Transport-Security: max-age=31536000`. This header forces clients to use HTTPS for subsequent visits to this domain. If the certificate is invalid, the client's web browser receives a fatal connection error and does not display a dialog that allows the user to override the certificate mismatch error and continue. If enabled, also configure the following: **HSTS Max-age**: Specify the time to live in seconds for the HSTS header. The HSTS enforcement will be lifted after the specified max-age. Subsequent visits will not be required to use HTTPS. **Include Sub Domains**: When enabled, the HSTS header will include the `includeSubDomains` attribute, meaning this setting will be applied to all sub-domains of your applications. **Redirect all HTTP traffic to HTTPS**: Enable to redirect all HTTP traffic to HTTPS.

Field	Description
Redirect all HTTP traffic to HTTPS (recommended)	Select to automatically redirect all HTTP requests to the HTTPS service with the same URL and parameters. Do not enable this option if you have only one origin server and want FortiAppSec Cloud to communicate with the origin server over both HTTP and HTTPS protocols. If you want to provide different content over HTTP and HTTPS protocols, Please refer to Network settings for applications serving different content over HTTP and HTTPS on page 168

Advanced Security and Protocol Settings

Configure advanced security features such as HTTP/2, client certificate authentication, and other protocol settings.

When **HTTP/2** is enabled, only certain **TLS 1.3** and **TLS 1.2** ciphers will be supported for all SSL/TLS encryption levels.

HTTP/2	Enable to accept HTTP/2 traffic.
Client Certificate Authentication	Enable it so that FortiAppSec Cloud requires a client to provide a client certificate during the SSL handshake. When enabled, if a client doesn't provide a client certificate during the SSL handshake, FortiAppSec Cloud won't accept the request. • Click **Import** to upload the trusted CA certificates so that FortiAppSec Cloud can authenticate client certificates. How to obtain CA certificate: • If you are using a commercial CA, your web browser should already contain a copy in its CA trust store. Export a copy of the file to your desktop or other folder. • If you are using your own private CA, download a copy from your CA's server. For example, on Windows Server 2003, you would go to: `HTTPs://<ca-server_ipv4>/certsrv/` where `<ca-server_ipv4>` is the IP address of your CA server. Log in as `Administrator`. Other accounts may not have sufficient privileges. The **Microsoft Certificate Services** home page for your server's CA should appear, and you can download a CA certificate, certificate chain, or CRL from there. **Note:** Verify that your private CA's certificate does not contain its private keys. Disclosure of private keys compromises the security of your network, and will require you to revoke and regenerate all certificates signed by that CA. • Click **Import** to upload the Certificate Revocation Lists. To ensure that FortiAppSec Cloud validates only certificates that have not been revoked,

	you should periodically upload current certificate revocation lists (CRL) that may be provided by certificate authorities (CA).
IPv6 Service	If IPv6 is enabled, both IPv4 and IPv6 are allowed to your application. If disabled, only IPv4 traffic is allowed.
Secure flag for internal Cookie	Enable to add the secure flag to cookies, which forces browsers to return the cookie only when the request is for an HTTPS page. When enabled, only the HTTPS request contains cookie, while the HTTP is cookieless.
HTTP Only flag for internal Cookie	Enable to add the "HTTP Only" flag to internal cookies, which prevents client-side scripts from accessing the cookie.
Custom Block Page	Select the block page that FortiAppSec Cloud displays to your users. It contains the following messages: • The error page FortiAppSec Cloud uses to respond to an HTTP request that violates a policy and the configured action is **Deny** or **Period Block**. • The "Server Unavailable!" page that FortiAppSec Cloud returns to the client when none of the server pool members are available either because their status is **Disable** or **Maintenance** or they have failed the configured health check. • The Captcha enforcement pages that FortiAppSec Cloud uses to differentiate between real users and automated users, such as bots. The custom block page is configured in **WAF > System Settings > Custom Block Pages**.

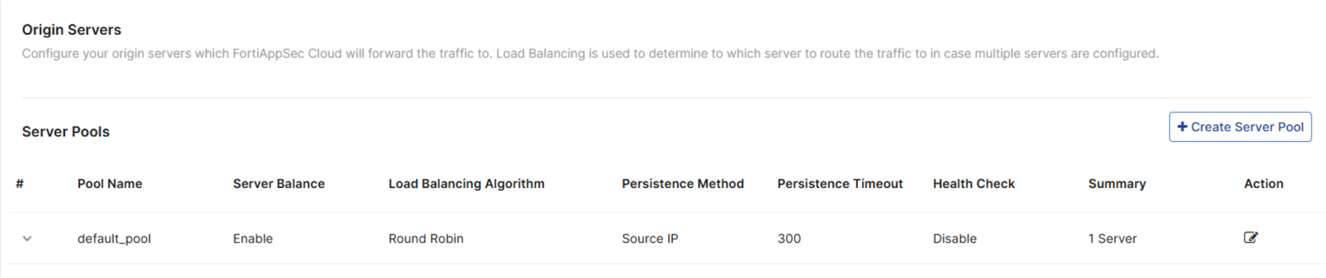
Origin Servers

Configure the origin servers which FortiAppSec Cloud will send the traffic to. If there are multiple origin servers, configure Load Balancing rules to determine how the traffic should be distributed among servers.

- Create Server Pool on page 69
- Create Server on page 71

You can lock your origin server's IP address to prevent other accounts on FortiAppSec Cloud from setting up an application targeting malicious traffic at your origin server. Please contact the cloud provider to request for the Origin Server Lock setup.

Create Server Pool



Origin Servers

Configure your origin servers which FortiAppSec Cloud will forward the traffic to. Load Balancing is used to determine to which server to route the traffic to in case multiple servers are configured.

Server Pools

#	Pool Name	Server Balance	Load Balancing Algorithm	Persistence Method	Persistence Timeout	Health Check	Summary	Action
˅	default_pool	Enable	Round Robin	Source IP	300	Disable	1 Server	✎

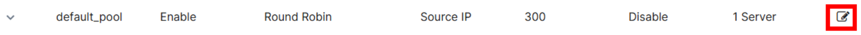
1. Navigate to **Network > Origin Servers**.
2. Click **Create Server Pool**.
3. Configure the following settings.

Field	Description
Pool Name	Supports letters (a-z, A-Z), numbers (0-9), dashes (-), and underscores (_). This cannot be changed after creation.
Server Balance	After the application is onboarded, **Server Balance** is enabled by default to apply load balancing algorithm to origin servers. If you disable this option, you can only configure one origin server, but both HTTP and HTTPS ports can be used for that server. We recommend keeping Server Balance on, even if you only have one server, because turning it off will delete all existing server settings. Additionally, server status monitoring won't be available when Server Balance is off. Only disable Server Balance if you need to use both HTTP and HTTPS with your origin server.
The following options are only available when **Server Balance** is enabled.	
Load Balancing Algorithm	• **Round Robin** — Distributes new TCP connections to the next server, regardless of weight, response time, traffic load, or number of existing connections. • **Weighted Round Robin** — Distributes new TCP connections using the round-robin method, except that members with a higher weight value receive a larger percentage of connections. • **Least Connection** — Distributes new TCP connections to the member with the fewest number of existing, fully-formed TCP connections. • **Source IP Hash** — Distributes new TCP connections using a hash algorithm based on the source IP address of the request. When the status of a server is set to **Disabled**, or a health check indicates it is down. FortiAppSec Cloud will transfer any remaining HTTP transactions in the TCP stream to an active server according to the Load Balancing Algorithm.
Persistence	After FortiAppSec Cloud has forwarded the first packet from a client to a server, some protocols require that subsequent packets also be forwarded to the same server until a period of time passes or the client indicates that it has finished transmission.

Field	Description
	Persistence specifies how FortiAppSec Cloud determines a request is the subsequent request from a client. • **Source IP**—The requests with the same client IP address and subnet as the initial request will be forwarded to the same server. • **Insert Cookie**—The requests with the same cookie name as the initial request will be forwarded to the same server. If you select **None**, the subsequent requests will be forwarded to random servers according to the Load Balancing Algorithm.
Persistence Timeout	Set the time, in seconds, after which an idle connection will cause FortiAppSec Cloud to select a new server from the pool.
Cookie Name	Specifies a value to match or the name of the cookie that FortiAppSec Cloud inserts. Available only when the **Persistence** is set to **Insert Cookie**.
Cookie Path	Specifies a path attribute for the cookie that FortiAppSec Cloud inserts. Available only when the **Persistence** is set to **Insert Cookie**.
Cookie Domain	Specifies a domain attribute for the cookie that FortiAppSec Cloud inserts. Available only when the **Persistence** is set to **Insert Cookie**.
Health Check	Enable to periodically test for server availability. If FortiAppSec Cloud determines the server is unresponsive, it will not forward traffic to this server until it becomes responsive again. Enable **Health Check** only if there are more than one origin servers associated with this application. When **Health Check** is enabled, you can click the **Test** icon in the origin server list to get the real-time status of a single server.
The following options are only available when **Health Check** is enabled	
URL Path	Type the URL that the HTTP or HTTPS request uses to verify the responsiveness of the server (for example, `/index.html`). If the web server successfully returns this URL, and its content matches the **Response Code**, it is considered to be responsive. By default, FortiAppSec Cloud uses the URL path "/" to test responsiveness of the server when you click **Test Origin Server** in the ADD APPLICATION wizard, then populates the response code received from the server in the **Response Code** field.
Interval	Type the number of seconds between each server health check. Valid values are 1 to 300. Default value is 10.
Timeout	Type the maximum number of seconds that can pass after the server health check. If the web server exceeds this limit, it will indicate a failed health check. Valid values are 1 to 30. Default value is 3.
Retry Times	Type the number of times, if any, that FortiAppSec Cloud retries a server health check after failure. If the web server fails the server health check this number of times consecutively, it is considered to be unresponsive.

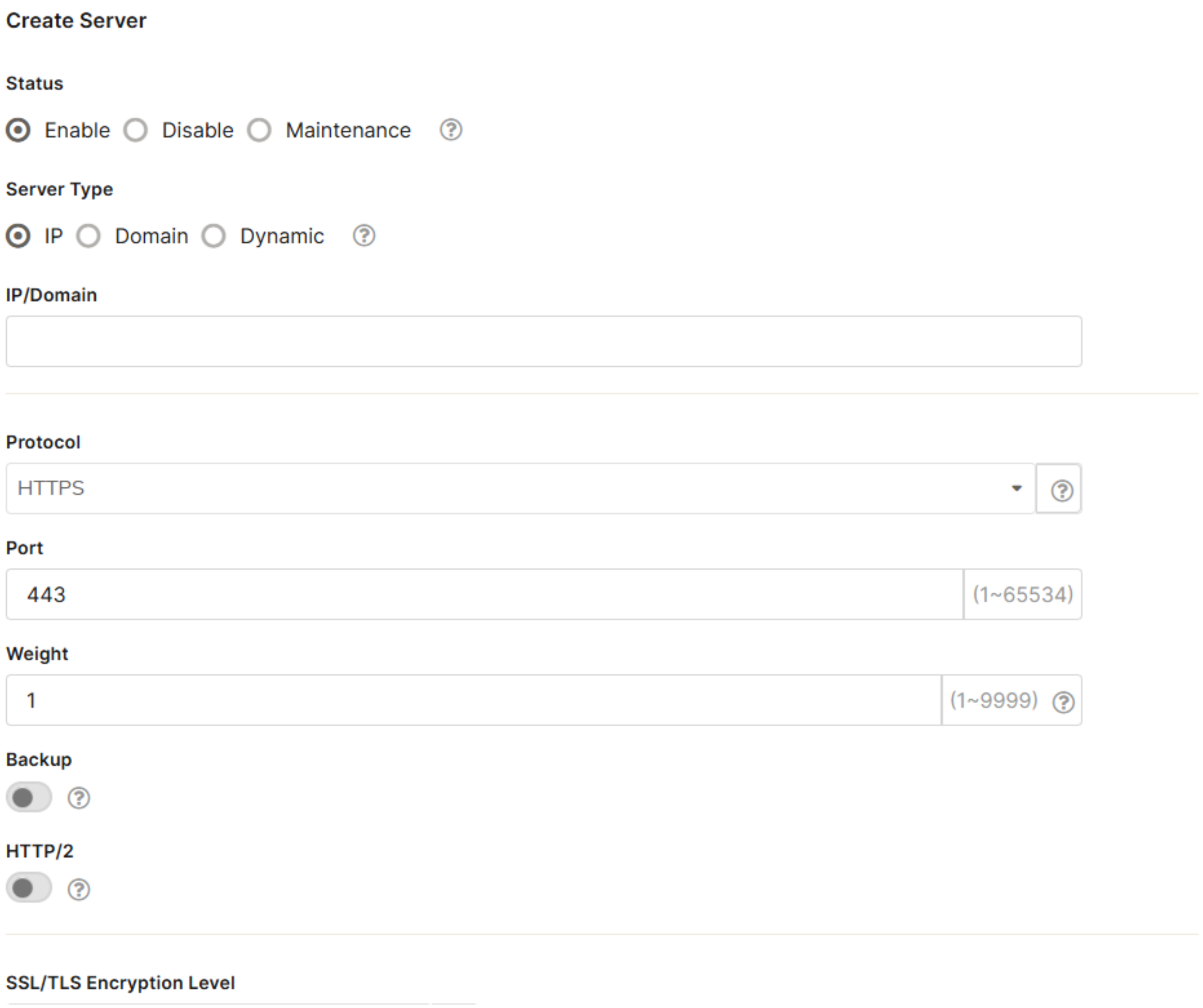
Field	Description
	Valid values are 1 to 10. Default value is 3.
Method	Specify whether the health check uses the HEAD, GET, or POST method.
Response Code	Enter the response code that you require the server to return to confirm that it is available.

4. Click **OK** to save the newly created server pool and return to the **Origin Servers** page, where you should see the newly added server pool in the **Server Pools** table. The server pool will be empty initially; follow the instructions below to add servers to this pool.
5. Click the **Edit** icon on one of the server pools to add servers to the server pool.



⌄	default_pool	Enable	Round Robin	Source IP	300	Disable	1 Server	✎

Create Server



Create Server

Status

● Enable ○ Disable ○ Maintenance ?

Server Type

● IP ○ Domain ○ Dynamic ?

IP/Domain

Protocol

HTTPS ▾ ?

Port

443 (1~65534)

Weight

1 (1~9999) ?

Backup

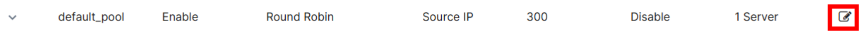
?

HTTP/2

?

SSL/TLS Encryption Level

1. On the **Network > Origin Servers** page, click the **Edit** icon on one of the server pools to view/edit its nested servers.



default_pool Enable Round Robin Source IP 300 Disable 1 Server

2. Click **Create Server Pool**

2. Configure the following settings.

3.

Status	• **Enable**—Specifies that this server can receive new sessions from FortiAppSec Cloud. • **Disable**—Specifies that this server does not receive new sessions from FortiAppSec Cloud and it closes any current sessions as soon as possible. • **Maintenance**—Specifies that this server does not receive new sessions from FortiAppSec Cloud but it maintains any current connections.
Server Type	Select either **IP** or **Domain** to indicate how you want to define the server. Select **Dynamic** if the server's IP address dynamically changes. This applies only to servers on AWS, Azure, and Google Cloud.
IP/Domain	Specify the IP address or fully-qualified domain name (FQDN) of the server. For domain servers, FortiAppSec Cloud queries a DNS server to resolve each web server’s domain name to an IP address/FQDN. For improved performance, it's recommended to use physical servers instead. Available only if the **Server Type** is **IP** or **Domain**.
Cloud Connector	Select the Cloud Connector so that FortiAppSec Cloud can be authorized to access the resources in your public cloud account. See Cloud Connectors on page 156. Available only if the **Server Type** is **Dynamic**.
Filter	Once you select the fabric collector that you have created, the available filter options for your VMs in your public cloud account will be listed here. You can select multiple filter options among instance IDs, image IDs, tags, etc. FortiAppSec Cloud will find the VM instance, for example, whose instance ID is i-12345678 in your AWS account, then obtain the IP address of this instance and record it as the origin server's IP. **AWS** • instance-id (e.g. instance-id=i-12345678) • image-id (e.g. image-id=ami-123456) • key-name (e.g. key-name=aws-key-name) • subnet-id (e.g. subnet-id=sub-123456) • tag:*TagName* (The tag attached to the instance. *TagName* is a variable. It can be any value you have named for the tag. e.g. tag:Type=appserver. Up to 8 tags are supported.) **Azure** • vm-name (e.g. vm-name=myVM01) • tag:*TagName* (The tag attached to the virtual machine. *TagName* is a variable. It can be any value you have named for the tag, e.g. tag:Type=appserver. Up to 8 tags are supported.) **GCP** • instance-id (e.g. instance-id=3528415166015934407)

	• instance-name (e.g. instance-name=myInstance) • labels.*LabelName*(The label attached to the instance. *LabelName* is a variable. It can be any value you have named for the tag, e.g. labels.Type=appserver. Up to 8 labels are supported.) Available only if the **Server Type** is **Dynamic**.
IP List	Click **Test** button. FortiAppSec Cloud will find the instances/virtual machines according to the filters selected above, then list their IP addresses. Available only if the **Server Type** is **Dynamic**.
Protocol & Port	Select whether this server connects with FortiAppSec Cloud through HTTP or HTTPS, then type the port number for the HTTP or HTTP protocol. The valid range is from 1 to 65,535. Only available when the Origin Servers on page 68 is on. If enabling HTTPS, see the next step for detailed configuration instructions.
HTTPS Port & HTTP Port	When the Origin Servers on page 68 is off, FortiAppSec Cloud can communicate with the origin server over both HTTP and HTTPS protocols. Specify the port number for both HTTP and HTTPS protocols. Only available when the Origin Servers on page 68 is off.
HTTP/2	When HTTPS is enabled, you can enable HTTP/2.
Weight	If TCP connections are distributed among the servers using the **Weighted Round Robin** load-balancing algorithm, servers with a greater weight receive a greater proportion of connections. Weighting servers can be useful when, for example, some servers are more powerful or if a server is already receiving fewer or more connections due to its role in multiple websites.
Backup	If enabled, when other servers fail their server health check, FortiAppSec Cloud routes any connections for the failed server to this server. If you have enabled Backup for more than one server, FortiAppSec Cloud uses the load balancing algorithm to determine which servers to use. The backup server mechanism does not work if you do not enable Health check in the loading balancing configurations.
Sever Certificate Authentication	Enable this option to secure the connection between FortiAppSec Cloud and the server. Please note this option is available to configure only when you have successfully added the server.
CA Certificate	If **Sever Certificate Authentication** is enabled, then you need to click **Import** to upload the SSL certificate to encrypt the HTTPS connection.
Certificate Revocation Lists	Click **Import** to upload the Certificate Revocation Lists. To ensure that FortiAppSec Cloud validates only certificates that have not been revoked, you should periodically upload current certificate revocation lists (CRL) that may be provided by certificate authorities (CA).

FortiAppSec CloudWAF continuously verifies the IP address paired with the domain name, and if the IP address changes, WAF automatically updates the origin server IP in its configuration. The frequency that WAF updates the IP depends on the TTL of the DNS record, which is usually 60 seconds in AWS ALB/ELB.

4. If HTTPS protocol is selected, you need to configure which versions of TLS protocol to use and the SSL encryption level.
   - **TLS Versions**: Select which versions of TLS protocols are allowed for the HTTPS connections between WAF and the server.
   - **SSL Encryption Level**: The HTTPS traffic is encrypted or decrypted with ciphers. **SSL Encryption Level** controls which ciphers are supported.
     - **Mozilla-Modern:** For services with clients that support TLS 1.3 and don't need backward compatibility, Mozilla-Modern is the recommended configuration as it provides an extremely high level of security.
     - **Mozilla-Intermediate:** For services that don't need compatibility with legacy clients such as Windows XP or old versions of OpenSSL, Mozilla-Intermediate is the recommended configuration as it is highly secure and in the meanwhile compatible with nearly every client released in the last five (or more) years.
     - **Mozilla-Old:** For services accessed by very old clients or libraries, such as Internet Explorer 8 (Windows XP), Java 6, or OpenSSL 0.9.8.
     - **Customized** – Supports a customizable list of all ciphers.
3. Click **OK**. This saves the new server under the selected server pool
4. For each created origin server, from the **Action** tab, you can delete the server, or edit the server information; also, you can click the Test icon to get the real-time server status.
   You can add at most 128 origin servers to the server pool of an application.

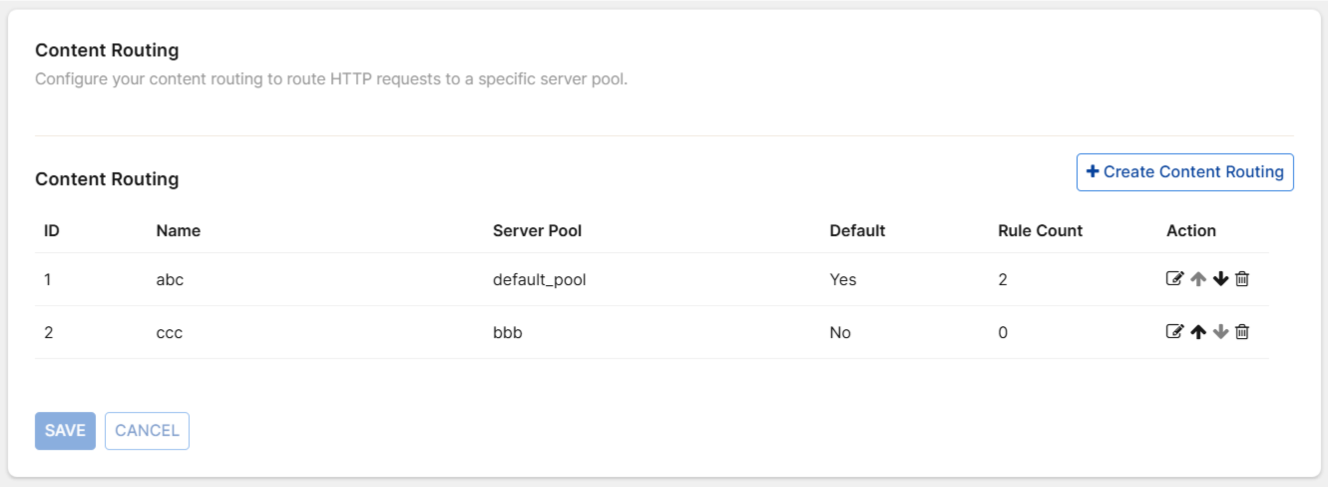
As the Health Check test packet is just a simulating one, the test result may not show the real server status.

Content Routing

Configure content routing rules to direct traffic to origin servers based on URL, Header, Cookie, Parameter, or Source IP. Configuration for multiple server pools and content routings is supported.

- Each application can have up to 32 content routings, with each content routing supporting up to 32 rules.
- For those using licenses purchased from Fortinet, the number of content routings you enable directly corresponds to the application license requirement.

  For example, an application with one content routing enabled uses the license space for one application, while an application with two content routings enabled uses the space for two applications, and so forth.



Content Routing

Configure your content routing to route HTTP requests to a specific server pool.

Content Routing

ID	Name	Server Pool	Default	Rule Count	Action
1	abc	default_pool	Yes	2	✎ ↑ ↓ 🗑
2	ccc	bbb	No	0	✎ ↑ ↓ 🗑

Enable Content Routing

1. Click **Add Modules** in the side navigation menu.
2. Under **Network**, enable **Content Routing**.

Disabling **Content Routing** via the **Add Modules** wizard will do the following:

- Permanently remove all existing content routing configurations
- Delete all origin server pools except for the default server pool.

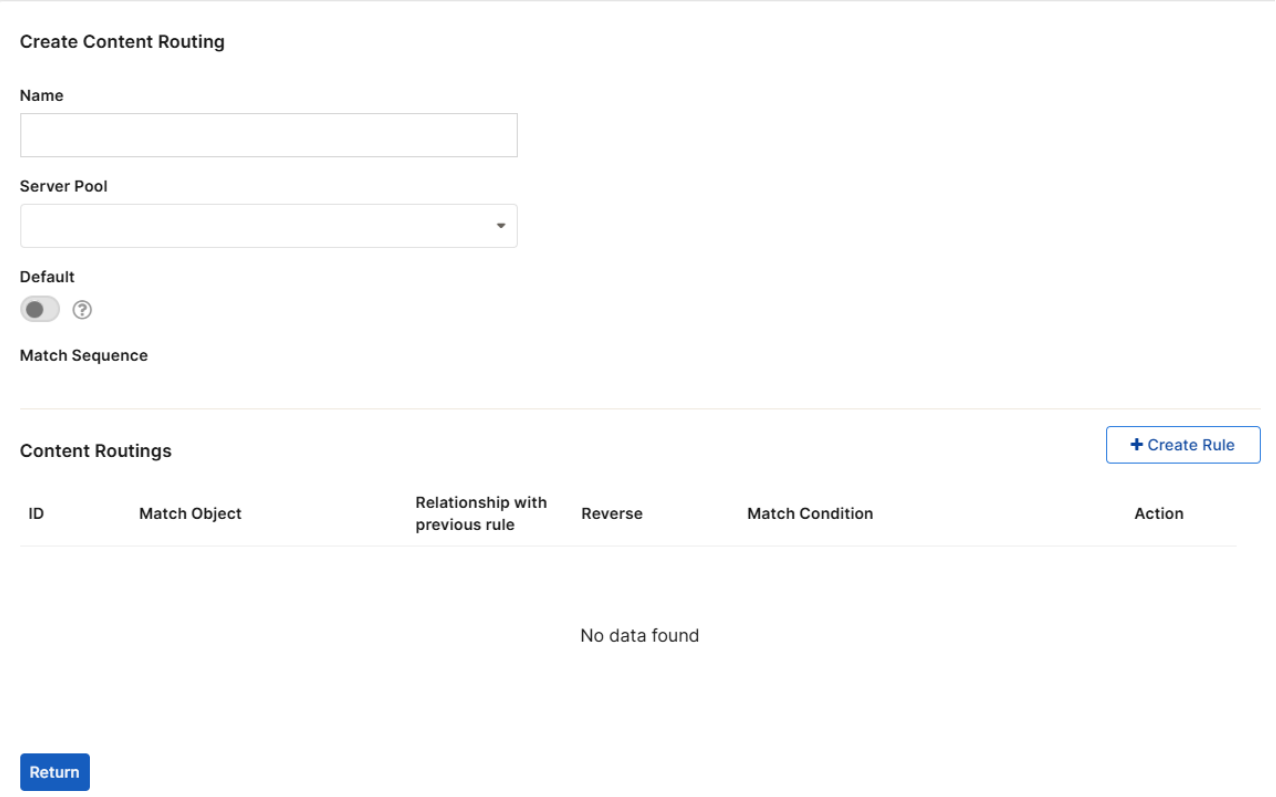
Once you enable **Content Routing**, you will be able to create server pools on **Network > Origin Servers**.

Please note, you cannot delete the default server pool. This ensures it remains available if you later disable the **Content Routing** module.

Create content routing rule

1. In the side navigation menu, click **Network > Content Routing**.
2. Click **Create Content Routing**.

   Please note, each application can have a maximum of 32 content routings, and each content routing can contain up to 32 rules.
3. Configure the following:



Create Content Routing

Name

Server Pool

Default

Match Sequence

Content Routings

+ Create Rule

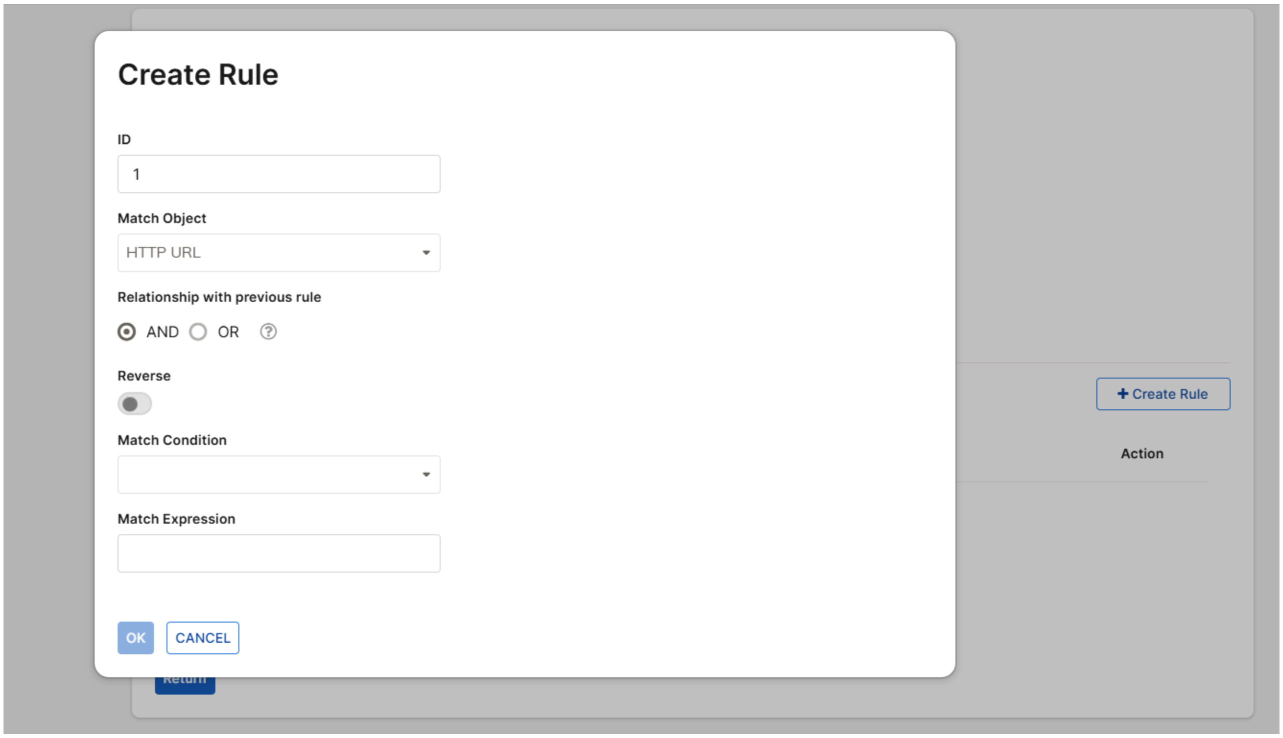
ID	Match Object	Relationship with previous rule	Reverse	Match Condition	Action

No data found

Return

Field	Description
Name	Enter an identifiable name for your routing.
Server Pool	Select the Server Pool you would like to direct traffic to.
Default	When enabled, traffic that does not match the Rules in any content routing will be directed to the **Server Pool** in the current content routing. Configuring a default routing ensures that all traffic is processed by a server pool, avoiding dropped traffic. Each application can have one default routing.

4. Click **Create Rule** to configure the desired traffic behavior under this routing.



Create Rule

ID

1

Match Object

HTTP URL

Relationship with previous rule

● AND ○ OR

Reverse

Match Condition

Match Expression

Field	Description
ID	A system-generated number that identifies the rule in its sequence within the content routing.
Match Object	The criteria used to base the rule for directing traffic. In this drop-down menu, you can select from the following options: • **HTTP Host** • **HTTP URL** • **URL Parameter** • **HTTP Referer** • **HTTP Cookie** • **HTTP Header** • **Source IP** • **HTTPS SNI**
Relationship with previous rule	Select whether the current rule should run concurrently with or as an alternative to the previous rule. For the first rule in a routing sequence, this field has no effect. Please note, rules bound by an AND relationship take precedence over those with OR relationships. This ensures all AND conditions must be met before considering OR conditions.
Reverse	If enabled, the rule will apply to all traffic that does not match the specified condition, rather than to all traffic that does match it.

The following configuration options will vary based on the selected **Match Object**.

If you set **Match Object** to **URL Parameter**, **HTTP Cookie**, or **HTTP Header**, configure the following:

Field	Description
Name Match Condition	Select an attribute in the traffic name that defines a match. • **Is equal to** — The rule applies to traffic names that fully match the specified value. • **Match prefix** — checks if the beginning of a string matches a specified prefix. For example, if the prefix is "api/", the condition will be true for strings like "api/v1/resource" but not for "web/v1/resource." • **Match suffix** — checks if the end of a string matches a specified suffix. For example, if the suffix is ".html", the "match suffix" condition will be true for URLs like "example.com/page.html" but not for "example.com/page.php". • **Match contains** — The rule applies to all traffic names that contains the specified value. • **Regular Expression** — The rule applies to all traffic names that match the specified regular expression.
Name	This field appears when **Match Object** is set to **URL Parameter**, **HTTP Cookie**, or **HTTP Header**. Enter what the **Name Match Condition** will use to match against.
Value Match Condition	Select an attribute in the traffic value that defines a match. • **Is equal to** — The rule applies to traffic values that fully match the specified value. • **Match prefix** — checks if the beginning of a string matches a specified prefix. For example, if the prefix is "api/", the condition will be true for strings like "api/v1/resource" but not for "web/v1/resource." • **Match suffix** — checks if the end of a string matches a specified suffix. For example, if the suffix is ".html", the "match suffix" condition will be true for URLs like "example.com/page.html" but not for "example.com/page.php". • **Match contains** — The rule applies to all traffic values that contains the specified value. • **Regular Expression** — The rule applies to all traffic values that match the specified regular expression.
Value	This field appears when **Match Object** is set to **URL Parameter**, **HTTP Cookie**, or **HTTP Header**. Enter what the **Value Match Condition** will use to match against.

If you set **Match Object** to **HTTP Host**, **HTTP URL**, **HTTP Referer**, **HTTPS SNI**, configure the following:

Field	Description
Match Condition	Select the attribute in the match object that defines a match. • **Is equal to** — The rule applies to traffic values that fully match the specified value. • **Match prefix** — checks if the beginning of a string matches a specified

Field	Description
	prefix. For example, if the prefix is "api/", the condition will be true for strings like "api/v1/resource" but not for "web/v1/resource." • **Match suffix** — checks if the end of a string matches a specified suffix. For example, if the suffix is ".html", the "match suffix" condition will be true for URLs like "example.com/page.html" but not for "example.com/page.php". • **Match contains** — The rule applies when the match object contains the specified value. • **Regular Expression** — The rule applies when the match object matches the specified regular expression. • **Match directory** — The rule applies when the match object contains the specified string between delimiting characters (slash) in a domain name. • **Match domain** — The rule applies when the match object contains the specified string between the periods in a domain name.
Match Expression	Enter what the **Match Condition** will use to match against.

If you set **Match Object** to **Source IP**, configure the following:

Field	Description
Match Condition	Select the attribute in the match object that defines a match. • **IPv4 Address/Range** — The rule applies when the match object is the specified IPv4 address or falls within the specified IPv4 address range. • **IPv6 Address/Range** — The rule applies when the match object is the specified IPv6 address or falls within the specified IPv6 address range • **Import From CSV File** — Instead of entering an IP range, upload a CSV file that contains a list of IP addresses. The rule will trigger when any of the listed IP addresses is detected in the match object.
IP range	Enter the IP range the **Match Condition** will use to match against.

5. Click **OK** to save the new rule.
6. Click **Save** to apply changes.

Supported cipher suites & protocol versions

A secure connection’s protocol version and cipher suite, including encryption bit strength and encryption algorithms, is negotiated between the client and the SSL/TLS terminator during the handshake.

The **SSL/TLS Encryption Level** controls how many ciphers are supported and the settings provides the following options:

- **Mozilla-Modern:** For services with clients that support TLS 1.3 and don't need backward compatibility, Mozilla-Modern is the recommended configuration as it provides an extremely high level of security.

- **Mozilla-Intermediate:** For services that don't need compatibility with legacy clients such as Windows XP or old versions of OpenSSL, Mozilla-Intermediate is the recommended configuration as it is highly secure and in the meanwhile compatible with nearly every client released in the last five (or more) years.
- **Mozilla-Old:** For services accessed by very old clients or libraries, such as Internet Explorer 8 (Windows XP), Java 6, or OpenSSL 0.9.8. Mozilla-old is the recommended configuration as it is compatible with most of the clients.
- **Customized** – Supports a customizable list of all ciphers.

Ciphers supported by Mozilla-Modern/Intermediate/Old levels

Cipher	Mozilla Modern	Mozilla Intermediate	Mozilla Old
TLS_AES_256_GCM_SHA384	Yes	Yes	Yes
TLS_CHACHA20_POLY1305_SHA256	Yes	Yes	Yes
TLS_AES_128_GCM_SHA256	Yes	Yes	Yes
ECDHE-ECDSA-AES128-GCM-SHA256		Yes	Yes
ECDHE-RSA-AES128-GCM-SHA256		Yes	Yes
ECDHE-ECDSA-AES256-GCM-SHA384		Yes	Yes
ECDHE-RSA-AES256-GCM-SHA384		Yes	Yes
ECDHE-ECDSA-CHACHA20-POLY1305		Yes	Yes
ECDHE-RSA-CHACHA20-POLY1305		Yes	Yes
DHE-RSA-AES128-GCM-SHA256		Yes	Yes
DHE-RSA-AES256-GCM-SHA384		Yes	Yes
DHE-RSA-CHACHA20-POLY1305			Yes
ECDHE-ECDSA-AES128-SHA256			Yes
ECDHE-RSA-AES128-SHA256			Yes
ECDHE-ECDSA-AES128-SHA			Yes
ECDHE-RSA-AES128-SHA			Yes
ECDHE-ECDSA-AES256-SHA384			Yes

Cipher	Mozilla Modern	Mozilla Intermediate	Mozilla Old
ECDHE-RSA-AES256-SHA384			Yes
ECDHE-ECDSA-AES256-SHA			Yes
ECDHE-RSA-AES256-SHA			Yes
DHE-RSA-AES128-SHA256			Yes
DHE-RSA-AES256-SHA256			Yes
AES128-GCM-SHA256			Yes
AES256-GCM-SHA384			Yes
AES128-SHA256			Yes
AES256-SHA256			Yes
AES128-SHA			Yes
AES256-SHA			Yes
DES-CBC3-SHA			Yes

Modules

When you onboard a new application on FortiAppSec Cloud, the system will automatically assign a security policy for your application, with the Security Rules and Access Rules modules enabled. You can select additional protection rules using the Modules tab.

For information on adding and removing a module, refer to Add and Remove Modules.

The following modules are available for FortiAppSec Cloud:

- Security Rules
- Client Security
- Access Rules
- Bot Mitigation
- DDoS Prevention Connection Limits
- Advanced Applications
- API Protection
- Account Takeover
- Application Delivery
- Global Trustlist

For any configuration you made in a module, it may take several minutes for the configuration to take effect.

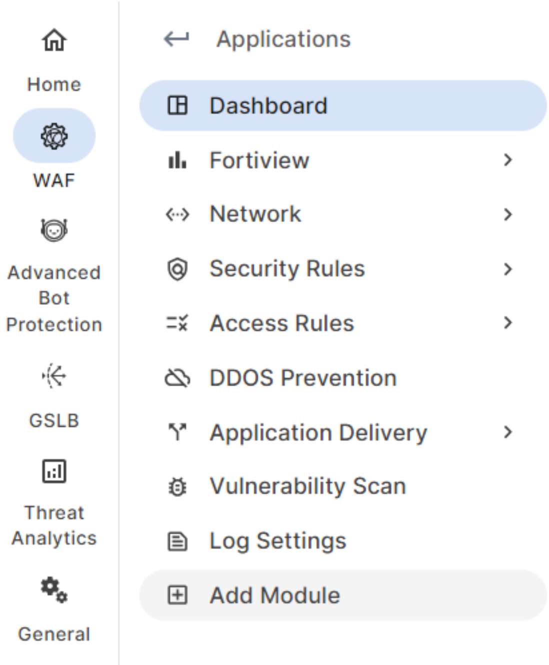
Add and Remove Modules

Each module allows you to customize a feature or add a particular type of security to your application.

Adding a module

To add a module

1. Go to **WAF > Application** and click into the desired application.
2. Click **WAF** in the side navigation bar to expand the menu, and click **Add Module**.



3. In the module list, locate the modules you want to add.
4. Click to enable them.
5. Click **OK**.

The modules you have added appear in the left navigation bar, and they are automatically enabled.

Removing a module

When you remove a module, the settings associated with it are reset to the initial configuration, and the data is deleted and cannot be recovered.

You can always add the module again to customize the settings.

To remove a module

1. Go to **Add Module**.
2. In the module list, locate the modules you want to remove.
3. Click to disable them.
4. Click **OK**.

The modules you have removed will disappear from the left navigation bar.

When you click to disable a module, the enabled fields remain ON status to help you track the previous configurations.

Security Rules

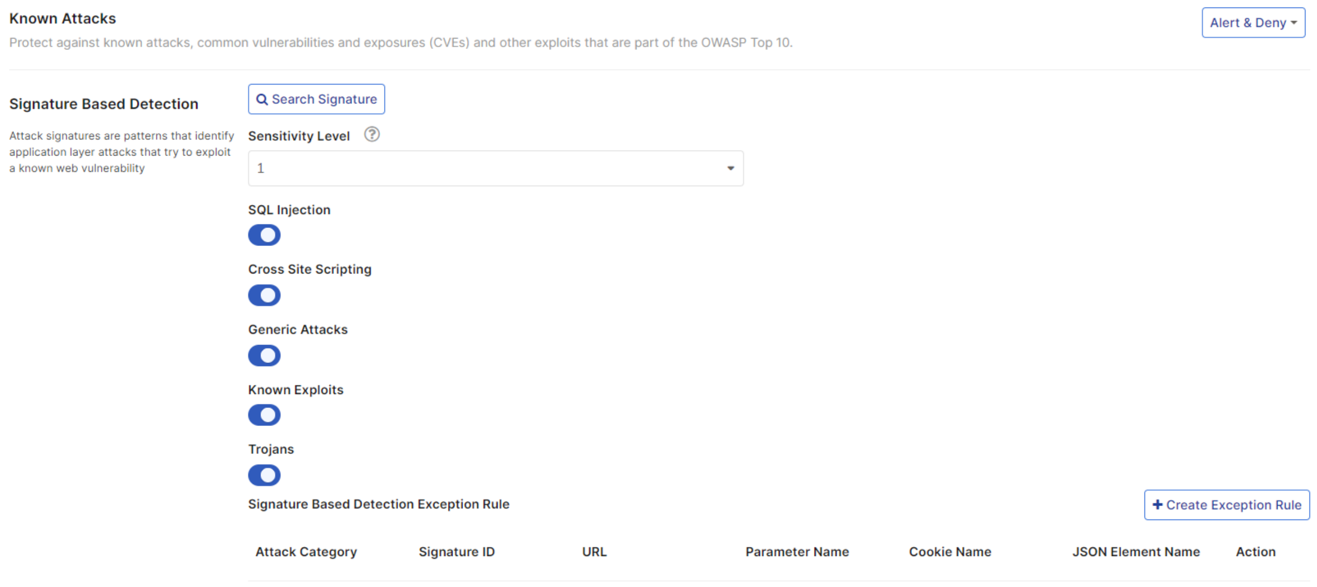
With security rules configured, FortiAppSec Cloud detects messages in HTTP requests that access web servers to prevent web servers from known attacks, protect the privacy-sensitive information in the messages such as Cookie, and restrict, scan uploaded files.

This module is enabled by default, as the Known Attacks option is enabled automatically once an application is added.

- Known Attacks
- Anomaly Detection
- Parameter Validation
- Information Leakage
- Cookie Security
- File Protection

Known Attacks

FortiAppSec Cloud defends against attacks in OWASP Top 10 including Cross-Site Scripting (XSS), SQL Injection, Generic Attacks, Known Exploits, and Trojans, by using continuously updated signatures. FortiAppSec Cloud parses messages in the packets, compares them with the signatures, and takes specified actions on the packets.



Known Attacks

Protect against known attacks, common vulnerabilities and exposures (CVEs) and other exploits that are part of the OWASP Top 10.

Signature Based Detection

Attack signatures are patterns that identify application layer attacks that try to exploit a known web vulnerability

Sensitivity Level: 1

SQL Injection: ●

Cross Site Scripting: ●

Generic Attacks: ●

Known Exploits: ●

Trojans: ●

Signature Based Detection Exception Rule

Attack Category	Signature ID	URL	Parameter Name	Cookie Name	JSON Element Name	Action

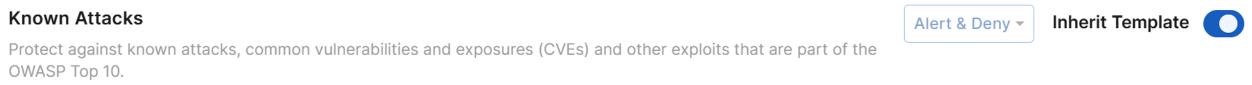
Configure Known Attacks

1. Go to **Security Rules > Known Attacks**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.

2. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.

Alert	Accept the request and generate a log message.
Alert & Deny	Block the request (or reset the connection) and generate a log message.
Deny(no log)	Block the request (or reset the connection) but do not generate log messages.

3. If your application is using a template, this page will display the **Inherit Template** switch next to the **action**. When enabled, this indicates the module's settings for the current application are inherited from the configured template.



Known Attacks

Protect against known attacks, common vulnerabilities and exposures (CVEs) and other exploits that are part of the OWASP Top 10.

Disabling **Inherit Template** switches the configuration source for all modules of this application from the template to the application's own settings. This allows for custom adjustments specific to the current application, without affecting other applications sharing the same template.

4. For **Signature Based Detection**, you can use attack signatures to detect application layer attacks that try to exploit a known web vulnerability
Configure these settings.

Sensitivity Level	The Sensitivity Level (SL) determines how aggressive the protection is against application signatures across different attack categories. SL1 is the least strict, and SL4 is the strictest. Higher sensitivity levels include more signatures that add additional protection but can also introduce false positives that would block legitimate traffic. **Note:** This setting also applies to the **Server Information Disclosure** and **Personally Identifiable Information** options under Information Leakage on page 93.
SQL Injection	Enable to prevent SQL injection attacks, such as blind SQL injection.
Cross Site Scripting	Enable to prevent a variety of cross-site scripting (XSS) attacks, such as varieties of CSRF (cross-site request forgery).
Generic Attacks	Enable to prevent other common attacks, including a variety of injection threats that do not use SQL, such as local file inclusion (LFI) and remote file inclusion (RFI).
Known Exploits	Enable to prevent known exploits.
Trojans	Enable to prevent malware attacks and prevent accessing Webshell located on server.

If you want to view the details of a specific signature, click **Search Signature** to find it by CVE Number, Keywords, Attack Category, Signature ID, or Sensitivity Level.

5. Click **Create Exception Rule** to omit attack signature scans when you know that some parameters or URLs cause false positives by matching an attack signature during normal use. Traffic that matches the exception rule(s) bypasses the configured security measures and will not be blocked.

Enable at least one option between **Request URL** and **Parameter Name**. Requests matching the specified URL and/or parameter in the exception rule will be exempted from being flagged as attacks.

Request URL	Specify a URL value to match. For example, `/testpage.php`, which match requests for `http://www.test.com/testpage.php`. • If **String Match** is selected, ensure the value starts with a forward slash (/) (for example, `/testpage.php`). You can enter a precise URL, such as /floder1/index.htm or use wildcards to match multiple URLs, such as /floder1/* ,or /floder1/*/index.htm. • If **Regular Expression Match** is selected, the value does not require a forward slash (/). However, ensure that it can match values that contain a forward slash. For details, see Frequently used regular expressions on page 177. Do not include a domain name because it's by default the domain name of this application.
Parameter Name	Specify a parameter name to match. For example, `http://www.test.com/testpage.php?a=1`, the parameter name is "a".
Cookie Name	Specify a cookie name to match. Both **String Match** and **Regular Expression Match** are supported.
JSON Elements	Specify the name of the JSON element to match. Both **String Match** and **Regular Expression Match** are supported.
Attack Category	Select an attack category in which you want to create an exception for its attacks therein.
Signature ID	The ID for the signature applied to the attack.
Signature Information	Signature description and examples are listed here. You can select any signature ID for the attack and view the signature details.

6. **SQL Syntax Based Detection**, enable the options to detect the corresponding SQL injection types. FortiAppSec Cloud uses an SQL parser to validate whether the pattern is real SQL language. It helps identify true attacks while minimizing false positives.
   The syntax-based detection detects an SQL injection attack by analyzing the lexeme and syntax of SQL language rather than using a pattern matching mechanism as the signature-based detection does.

7.

Stacked Queries SQL Injection	Enable to block attacks that exploit vulnerabilities by appending multiple SQL queries to execute unauthorized commands.
Embedded Queries SQL Injection	Enable to block attacks that insert malicious queries within legitimate ones to manipulate database responses.
Condition-Based Boolean Injection	Enable to block attacks that evaluate true/false conditions in SQL statements to infer sensitive data.
Arithmetic Operation-Based Boolean Injection	Enable to block attacks that leverage arithmetic operations in SQL queries to deduce information based on responses.
Line Comments	Enable to block attacks that use SQL comments to bypass query syntax and inject malicious commands.
SQL Function-Based Boolean Injection	Enable to block attacks that exploit SQL functions to assess query behavior and extract data.

8. In **XSS Syntax Based Detection**, enable theEnable to block attacks that option to detect the corresponding XSS attack types. FortiAppSec Cloud detects an XSS injection attack by analyzing the HTML/JavaScript syntax.
   It does HTML document parsing and JavaScript compiling, and checks whether the compiled results include valid HTML and JavaScript codes.

9.

HTML Tag Based XSS Injection	Enable to block attacks that embed malicious scripts within HTML tags to manipulate webpage behavior.
HTML Attribute Based XSS Injection	Enable to block attacks that inject harmful code into HTML attributes to execute unauthorized actions.
HTML CSS Based XSS Injection	Enable to block attacks that exploit CSS properties in HTML to deliver malicious scripts or alter visual elements.
JavaScript Function Based XSS Injection	Enable to block attacks that insert harmful code into JavaScript functions to execute unauthorized operations.
JavaScript Variable Based XSS Injection	Enable to block attacks that manipulate JavaScript variables to inject and execute malicious scripts.
Syntax Based Detection Exception Rule	Enable to block attacks that excludes specific syntax patterns from triggering security rules, allowing controlled exceptions.

10. Click **Create Exception Rule** to omit Syntax Based attack scans when you know that some parameters or URLs may trigger Syntax Based Detection false positives during normal use. Traffic that matches the exception rule(s) bypasses the configured security measures and will not be blocked.

Request URL	Specify a URL value to match. For example, `/testpage.php`, which match requests for `http://www.test.com/testpage.php`. • If **String Match** is selected, ensure the value starts with a forward slash (/) (for example, `/testpage.php`). You can enter a precise URL, such as /floder1/index.htm or use wildcards to match multiple URLs, such as /floder1/* ,or /floder1/*/index.htm. • If **Regular Expression Match** is selected, the value does not require a forward slash (/). However, ensure that it can match values that contain a forward slash. For details, see Frequently used regular expressions on page 177. Do not include a domain name because it's by default the domain name of this application.
Parameter Name	Specify a parameter name to match. For example, `http://www.test.com/testpage.php?a=1`, the parameter name is "a".
Cookie Name	Specify a cookie name to match. Both **String Match** and **Regular Expression Match** are supported.
Attack Category	Select an attack category in which you want to create an exception for its attacks therein.
Attack Name	Select the attack name. • Stacked queries SQL injection: The snippet of this attack can be something like "1; delete from users". • Embedded queries: The snippet of this attack can be something like "1

	union select username, password from users 1 /*! ; drop table admin */ ".

11. Click **SAVE**.

Anomaly Detection

Use machine learning-enabled Anomaly Detection to block zero day threats and other sophisticated attacks by automatically building and maintaining a model of normal user behavior. To determine if a request is legitimate or a potential malicious attack, the system performs the following tasks:

- Captures and collects inputs, such as URL parameters, to build a mathematical model of allowed behavior.
- Matches anomalies against pre-trained threat models.
- Identifies and flags potential attack attempts based on deviations from the established model.

Once an anomaly is triggered by the mathematical model, FortiAppSec Cloud uses pre-built trained threat models to confirm whether it's a real attack or just a benign anomaly that should be ignored. Each threat model is already trained based on analysis of thousands of attack samples and is continuously updated using the FortiWeb Security Service.

This module is a FortiAppSec Cloud Premium feature.

Model settings

FortiAppSec Cloud parses all the URLs in a domain, and builds anomaly detection models for all parameters attached to the URLs.

After anomaly detection model is built, the system will keep on calculating the probability of the new samples and compare it against the model. If the probability of the new samples varies to a large extent for a long period, the system determines this parameter has changed and automatically rebuilds the model based on the new samples.

To configure anomaly detection:

1. Go to **Security Rules > Anomaly Detection**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Configure the following settings.

IP List Type	• **Trust:** The system will collect samples only from the IP ranges in the **Source IP list**. • **Block:** The system will collect sample from any IP addresses except the ones in the **Source IP list**. Whichever option you choose, if you leave the **Source IP list** blank, the system will collect traffic data samples from any IP address.
Source IP List	Click **Create New** to list the IP ranges of the samples. Depending on whether you select **Trust** or **Block**, FortiAppSec Cloud will or will not collect samples from the specified IP ranges.

3. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.
   To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings >**

Settings.

Alert	Accept the request and generate a log message.
Alert & Deny	Block the request (or reset the connection) and generate a log message.

4. Click **SAVE**.

Due to database migration, the Anomaly Detection machine learning data will be removed after upgrade to 23.1. The system will rebuild the model after upgrade.

Overview

The Overview tab provides a high level summary of data collected for the domain, including Top 10 URLs by Hit, Violations triggered by anomalies, HMM learning process, Event Dashboard.

Domain overview

The top of the Overview page provides a summary of the data that the machine-learning module has learned about the domain.

Parameters	Description
Access Frequency	Indicates how frequently this application is being accessed. • Level1 (over 500 requests) • Level2 (over 1000 requests) • Level3 (over 1500 requests) • Level4 (over 2000 requests) • Level5 (over 2500 requests) • Level6 (over 3000 requests) • Level7 (over 3500 requests)
Start Time	The date and time when the machine-learning module started to learn about the domain.
URL Number	The total number of URLs that the machine-learning module has learned.
Block	The total number of block actions that have been triggered since the start time up to the present moment.
Service(HTTP/HTTPS)	The total amount of the HTTP and the HTTPS traffic from the start time up to now.
Page Charset	The charset of URLs in the domain, such as UTF-8.

Top 10 URLs by Hit

This chart displays the top 10 URLs for page hits counts.

Violations Triggered by Anomalies

This chart displays the total number of the potential anomalies and definite anomalies found by the anomaly detection profile.

Learning Progress

This chart displays the statistics of machine learning states of all parameters in the domain. Hover over the circle to check how many parameters are in Collecting, Building, Testing, Running, or Discarded stages respectively. For the explanation of each stage, see Anomaly Detection on page 89.

Machine Learning Events

This chart displays the anomaly detection events, such as sample collection, model running, building and testing, along with the time periods when these events take place.

Tree View

This tab displays the entire URL directory of the domain in a tree view. You can choose either one of the URLs to view its violation statistics.

Web site directory

The left panel of the **Tree View** page shows the directory structure of the website. The / (backslash) indicates the root of the site. You can click a URL in the directory tree, then the violation statistics of this URL will be displayed on the right side of the Tree View page. You can also click a directory, then click **Relearn Directory** or **Rebuild Directory** to relearn or rebuild anomaly detection models for all the URLs under the selected directory.

URL summary

This part of the Tree View page shows the statistics of a specific URL.

Parameters	Description
Access Frequency	The frequency at which this URL was accessed in last 24 hours. The frequency is divided into 7 levels, as defined below: • Level1 (over 500 requests) • Level2 (over 1000 requests) • Level3 (over 1500 requests) • Level4 (over 2000 requests) • Level5 (over 2500 requests) • Level6 (over 3000 requests) • Level7 (over 3500 requests)
Model Initialization Date	The date and time when the mathematical model of this URL was initialized. It shows when FortiAppSec Cloud began to learn about the data of this URL.
Block	The total number of block actions that have been triggered against this URLsince the start time up to the present moment.
Anomaly	The anomalies detected by the anomaly detection model.

Violation Trend

This chart shows the trend of violations in last 24 hours.

Parameter list

The Parameters list shows all the parameters attached to the URL. For example, if the URL is http://www.demo.com/1.php?user_name=jack, then user_name is the parameter. The system builds machine learning model for each parameter, and detects the abnormal parameter values.

Parameter Validation

Define validation rules to only permit requests that meet specific parameter (input) requirements to your web applications. According to the defined rules, FortiAppSec Cloud can deny any invalid requests or block the request's IP for a period of time, as well as record the invalid requests in the attack log.

A parameter validation rule is composed of a validation operation that will be applied to a URL and one or more validation restrictions to limit parameters, such as to specify whether or not the parameter is required, its maximum allowed length, or its data type.

FortiAppSec Cloud requires at least one parameter rule to be added for each request URL to successfully apply parameter validations. Otherwise, FortiAppSec Cloud will accept all requests if there are no restrictions placed on any parameters.

To create a parameter validation rule:

1. Go to **Security Rules > Parameter Validation**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Click **Create Rule**.
3. Configure the following to set the validation operation.

Name	Enter a name for the parameter validation rule.
Request URL	Enter the URL to which the validation rule will be applied.
Operation	Select the action that will be triggered by the validation rule: • **Alert** – FortiAppSec Cloud will record the invalid request in the attack log. • **Deny** – FortiAppSec Cloud will block the invalid request and send a "block page" back to the browser, as well as record the request in the attack log. • **Deny (no log)** – FortiAppSec Cloud will block the invalid request and send a "block page" back to the browser. • **Period Block** – Block the current request. Moreover, all the subsequent requests from the same client in the next 10 minutes will also be blocked. If **Period Block** is selected, specify the time period between 1 to 3600 seconds.

4. Click **Add Rule**.

5. Configure the following to define the parameter restriction rule.

Parameter Name	Type a regular expression that matches the parameter whose values you want to validate. To create a regular expression, see Frequently used regular expressions on page 177.
Max Length	Specify the maximum allowed length of the parameter between 0 to 1024 characters.
Required	Specify whether or not the parameter is required. **Note:** If there isn't any parameter in the request URL, the parameter validation will not be triggered, which means the traffic will let go even if you have configured required parameters in the parameter restriction rule. Parameter validation takes effect only when there is at least one parameter in the request URL.
Use Type Check	Specify whether or not to check the data-type of the parameter.
Argument Type	Specify the argument type of the parameter: • **Data Type** • **Regular Expression** Available only if you enabled **Use Type Check**.
Data Type	Select a predefined data type from the drop-down list to limit the format of the parameter value. Available only if you enabled **Use Type Check** and selected **Data Type** as the **Argument Type**.
Regular Expression	Type a regular expression to limit the format of the parameter value. To create a regular expression, see Frequently used regular expressions on page 177. Available only if you enabled **Use Type Check** and selected **Regular Expression** as the **Argument Type**.

6. Click **Save Rule**.
7. Repeat steps 2-6 until you have added all desired rules, or click **OK** to save configurations and return to the **Parameter Validation** page.
8. Click **SAVE** to apply configurations.

Information Leakage

FortiAppSec Cloud can detect server error messages and other sensitive messages in the HTTP headers.

To configure attacks to defend

1. Go to **Security Rules > Information Leakage**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Configure these settings.

Server Information Disclosure	Enable to detect and erase server specific sensitive information in headers and response page, with no alerts generated.
Personally Identifiable Information	Enable to identify personally identifiable information (PII).

Cloak Error Pages	Enable to replace 403, 404, and 5XX with 500 error code.
Erase HTTP Headers	Enable to cloak server replied HTTP headers. You can add multiple HTTP headers in which the sensitive information will be hidden.

3. Click **+Create Exception Rule** (optional).
   You can also configure FortiAppSec Cloud to omit attack signature scans by creating exception rules.
4. Configure these settings.

URI	Specify a Uniform Resource Identifier (URI), for example, `http://www.example.com`.
Request URL	Specify a URL value to match. For example, `/testpage.php`, which match requests for `http://www.test.com/testpage.php`. • If **String Match** is selected, ensure the value starts with a forward slash (/) (for example, `/testpage.php`). You can enter a precise URL, such as /floder1/index.htm or use wildcards to match multiple URLs, such as /floder1/* ,or /floder1/*/index.htm. • If **Regular Expression Match** is selected, the value does not require a forward slash (/). However, ensure that it can match values that contain a forward slash. For details, see Frequently used regular expressions on page 177. Do not include a domain name because it's by default the domain name of this application.
Parameter Name	Specify a parameter name to match. For example, `http://www.test.com/testpage.php?a=1`, the parameter name is "a".
Cookie Name	Specify a cookie name to match. Both **String Match** and **Regular Expression Match** are supported.
JSON Elements	Specify the name of the JSON element to match. Both **String Match** and **Regular Expression Match** are supported.
Attack Category	You can select an attack category between: • **Server Information Disclosure** • **Personally Identifiable Information**
Signature ID	The ID for the signature applied to the attack.
Signature Information	Signature description and examples are listed here. You can select any signature ID for the attack and view the signature details.

You must enable at least one of the following: **Request URL** or **Parameter Name.** The request matching the specified URL and/or parameter in exception rule would not be treated as an attack even if it matches a particular signature.

5. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.
   To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate a log message. To avoid log flooding, the minimum interval between logs is 1 second.
Erase & Alert	Hide or remove sensitive information in replies from the web server (sometimes called “cloaking”) and generate a log message. To avoid log flooding, the minimum interval between logs is 1 second.
Deny & Erase(no log)	For violations of the **Server Information Disclosure**, **Cloak Error Pages**, and the **Erase HTTP Headers** categories, hide or remove sensitive information in replies from the web server but do not generate log messages.

6. Click **SAVE**.
   You can continue creating multiple exception rules for specific attacks.

Cookie Security

FortiAppSec Cloud can protect against cookie poisoning and other cookie-based attacks. When **Cookie Security** module is added FortiAppSec Cloud signs all cookies by default.

To create cookie security rules

1. Go to **SECURITY RULES > Cookie Security**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Configure these settings.

Cookie Replay Protection	Enable to select whether FortiAppSec Cloud uses the IP address of a request to determine the owner of the cookie and protect against replay attacks.
Set Max Cookie Age	Enter the maximum age (in minutes) permitted for cookies that do not have an “Expires” or “Max-Age” attribute. To configure no expiry age for cookies, enter `0`.
Security Mode	• **None**—FortiAppSec Cloud does not apply cookie tampering protection or encrypt cookie values. • **Signed**—Prevents tampering (cookie poisoning) by tracking the cookie value. When FortiAppSec Cloud receives the first HTTP or HTTPS request from a client, it uses a cookie to track the session. When you select this option, the session-tracking cookie includes a hash value that FortiAppSec Cloud uses to detect tampering with the cookie from the backend server response. If FortiAppSec Cloud determines the cookie from the client has changed, it takes related action. • **Encrypted**—Encrypts cookie values the back-end web server sends to clients. Clients see only encrypted cookies. FortiAppSec Cloud decrypts cookies submitted by clients before it sends them to the back-end server.
Set Secure Cookie	Enable to add the secure flag to cookies, which forces browsers to return the cookie only when the request is for an HTTPS page.

	This function applies to the cookie from origin server. If you want to modify the cookie from browser, please refer to **Secure flag for internal Cookie** in Endpoints.
Set HTTP Only Cookie	Enable to add the "HTTP Only" flag to cookies, which prevents client-side scripts from accessing the cookie. This function applies to the cookie from origin server. If you want to modify the cookie from browser, please refer to **HTTP Only flag for internal Cookie** in Endpoints.
Set Same Site Cookie	Enable to restrict cookies that fall outside of a first-party or same-site context. **Same Site Value** • **Strict** — Cookies will not be included in any requests from third parties. • **Lax** — Cookies will not be included in third-party requests, except for GET requests that navigate to the destination URL. • **None** —Use this option if a cookie needs to be sent across different origins.
Exempted Cookies	If you want to specify cookies that are exempted from the cookie security policy, click to add cookie names. If you use wildcard in cookie name, please check the box beside the cookie name field.

3. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner. To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate a log message.
Alert & Deny	Block the request (or reset the connection) and generate a log message.
Deny(no log)	Block the request (or reset the connection) but do not generate log messages.
Remove Cookie	Accept the request, but remove the cookie from the datagram before it reaches the web server, and generate a log message.

4. Click **SAVE**.

File Protection

You can configure FortiAppSec Cloud to perform the following tasks.

- Restrict file uploads based upon file type and size.
- Scan uploaded files for viruses and Trojans.
- Submit uploaded files for evaluation and generate attack log messages for files that FortiAppSec Cloud has identified as threats.

1. Go to **Security Rules> File Protection**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.

2. Configure these settings.

Trojans/Backdoor	Attackers may attempt to upload Trojan horse code (written in scripting languages such as PHP and ASP) to the back-end web servers. The Trojan then infects clients who access an infected web page. Enable to detect Trojans in the uploaded files.
Antivirus Scan	Enable to scan for viruses, malware, and greyware. Please note that due to caching limits, this feature can only process files smaller than 5 MB.
Advanced Threat Protection	Enable to send matching files to FortiSandbox Sandbox for evaluation. Sandbox file evaluation is performed in the same region where the FortiAppSec Cloud cluster is located. This ensures compliance with various data regulations such as GDPR. This option works only when your application is hosted on AWS or Azure.
File Size Limit	Define the maximum allowed size for the file to upload.
File Type Validation	Define the allowed and blocked file types. Select file types by clicking **Change** button, and then select to allow or block such files with **Allow** and **Block** buttons. **Note:** The ".zip" file compressed from the compression software (not the command line) that comes with the MacOS and Linux GUI operating systems has the same binary code with the ".jar" file. As a result, blocking the ".jar" file may incorrectly block the ".zip" file. To solve this problem, either warn your users not to use the compression methods mentioned above, or do not block the **Java Archive(.jar)** type.
Target URL	Define the target URL that accepts the uploads.
JSON File Support	Enable if you want to further parse the information contained in uploaded JSON files. **File Name JSON Key Field**- Locate the value of the filename parameter, and compare it against the value you entered in this field. This is optional. **File Upload JSON Key Field**- Locate the value of the content parameter, and compare it against the value you set in this field.

3. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.
To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate a log message.
Alert & Deny	Block the request (or reset the connection) and generate a log message.
Deny(no log)	Block the request (or reset the connection) but do not generate log messages.

4. Click **SAVE**.

Client Security

You can configure FortiAppSec Cloud to prevent web-related attacks such as clickjacking, CSRF attacks, and MITB attacks.

- CSRF Protection
- HTTP Header Security
- MITB Protection

HTTP Header Security

HTTP response security headers are a set of standard HTTP response headers proposed to prevent or mitigate known XSS, clickjacking, and MIME sniffing security vulnerabilities. These response headers define security policies to client browsers so that the browsers avoid exposure to known vulnerabilities when handling requests.

When enabling this feature, headers with specified values are inserted into HTTP responses coming from the backend web servers. This is a quick and simple solution to address the security vulnerabilities on your website without code and configuration changes. The following includes the security headers that FortiAppSec Cloud can insert into responses.

To configure HTTP Header Security, you must have already enabled this module in **Add Modules**. See Add and Remove Modules.

X-Frame-Options	This header prevents browsers from **Clickjacking attacks** by providing appropriate restrictions on displaying pages in frames.
X-Content-Type-Options	This header prevents browsers from **MIME content-sniffing attacks** by disabling the browser's MIME sniffing function.
X-XSS-Protection	This header enables a browser's built-in **Cross-site scripting (XSS)** protection.
Content-Security-Policy	Enable to prevent certain types of attacks, including XSS and data injection attacks by inserting this header (e.g. default-src 'self'; script-src 'self'; object-src 'self').

CSRF Protection

A cross-site request forgery (CSRF) is an attack that exploits the trust that a site has in a user's browser to transmit unauthorized commands. FortiAppSec Cloud uses a dedicated, per user token to track access to protected pages. To protect back-end servers from CSRF attacks, you create two lists of items, a list of web pages to protect against CSRF attacks, and a corresponding list of the URLs found in the requests that the pages generate.

To configure CSRF Protection, you must have already enabled this module in **Add Modules**. See Add and Remove Modules.

To create a page list

1. Click **+Create Page List Table**.
2. Configure these settings.

Full URL	Enter a literal URL, for example, `/www.test.com`.
Parameter Filter	Enable to specify a parameter name and value to match. The parameter can be located in either the URL or the HTTP body of a request.
Parameter Name	Enter the parameter name to match.
Parameter Value	Enter a value for the parameter.

3. Click **OK**.

You can continue creating multiple page lists.

To create a URL list

1. Under **URL List Table**, click **+Add URL List Table**, configure these same settings as for adding a page list.
2. Click **SAVE**.

You can continue creating multiple URL lists.

To configure actions

1. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner. To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).

2. Click **SAVE**.

MITB Protection

The Man-in-the-Browser (MITB) attack uses Trojan Horse to intercept and manipulate calls between the browser and its security mechanisms or libraries on-the-fly. The Trojan Horse sniffs or modifies transactions as they are formed on the browser, but still displays back the user's intended transaction. The most common objective of this attack is to cause financial fraud by manipulating transactions of Internet Banking systems, even when other authentication factors are in use.

To protect the user inputs from being attacked by MITB, FortiAppSec Cloud implements security rules including obfuscation, encryption, anti-keylogger, and Ajax request allowlist.

Obfuscation

To prevent the MITB attack from identifying the names of the user input field , FortiAppSec Cloud obfuscates it into meaningless character strings based on Base64 encoding rule.

For example, for the account name, passwords, and other sensitive user input fields on a transaction page, the obfuscation rule is used to disguise the real values of the input field names.

Encryption

To protect the password that users enter into the web page, FortiAppSec Cloud encrypts the password from a readable form to an encoded version based on Base64 encoding rule. The encrypted password can only be decoded by FortiAppSec Cloud.

Anti-Keylogger

Sometimes the MITB attack installs a key logger on users' browsers and records each key pressed. Sensitive data such as passwords can be intercepted and recorded, compromising the user account.

If the Anti-Keylogger rule is enabled for the password parameter, FortiAppSec Cloud prevents it from being recorded even if there is a key logger installed on user's browser.

AJAX Request allowlist

The MITB attack may use a malicious AJAX worm to hack into the user's browser. It creates an AJAX based sniffer to override the OPEN and SEND function of the AJAX request, and then send the data to a program on a different domain.

FortiAppSec Cloud supports configuring an allowlist for AJAX requests. If the user's browser sends AJAX requests to an external domain which is not in the allowlist, FortiAppSec Cloud will take action according to your configuration.

To configure MITB Protection, you must have already enabled this module in **Add Modules**. See How to add or remove a module.

- Configure the settings below to define the URL to protect.

Request URL	Enter the literal URL which hosts the web page containing the user input fields you want to protect.
POST URL	When the user inputs (e.g. password) are posted to the web server, a new URL will open. This is the POST URL. The format of the POST URL field is similar to that of the Request URL field. Note: The AJAX request rule only checks the Request URL, and it doesn't involve POST URLs, so the POST URL of the AJAX request rule should be set as "*" to match any URLs.

- To protect the standard user input and passwords, click **+Create Protected Parameter**, and configure these settings.

Input Name	Enter the name of the user input field, which shall be exactly the same with the name of user input field in the source code of the web page.
Type	Select either **Standard Input** or **Password Input**.
Obfuscate	Available when the Type is either **Standard Input** or **Password Input**.
Encrypt	Available when the Type is **Password Input**.
Anti-KeyLogger	Available when the Type is **Password Input**.

- To add an allowlist for the AJAX Request, click **+Create External Domain**, and enter the external domain address. If the user's browser sends AJAX request to an external domain which is not in the domain list you have entered, FortiAppSec Cloud will take actions (alert, or alert & deny) accordingly.
- Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner. To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings >**

Settings.

Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.

- Click **SAVE**.

Access Rules

You can control clients' access to your web applications and limit the rate of requests. Multiple ways are available for this, depending on whether you are to act based upon the URL, the client's source IP, or something more complex.

This module is enabled by default, as the Request Limits option is enabled automatically once an application is added.

- Request Limits
- URL Access
- IP Protection

Request Limits

Request limits enforces limitations at the HTTP protocol level to make sure all client requests adhere to the HTTP RFC standard and security best practice. With this feature, you can prevent exploits such as malicious encoding and buffer overflows that can lead to Denial of Service (DoS) and server takeover.

Specifying allowed HTTP methods

You can configure FortiAppSec Cloud to allow only specific HTTP request methods.

Mark the check boxes for all HTTP request methods that you want to allow. Methods that you do not select will be denied.

Configuring HTTP protocol constraints

Protocol constraints govern features such as the HTTP header fields in the protocol itself, as well as the length of the HTML, XML, or other documents or encapsulated protocols carried in the HTTP body payload.

Use protocol constraints to prevent attacks such as buffer overflows. Buffer overflows can occur in web servers and applications that do not restrict elements of the HTTP protocol to acceptable lengths, or that mishandle malformed requests. Such errors can lead to security vulnerabilities.

To configure an HTTP protocol constraint profile

1. Go to **ACCESS RULES > Request Limits**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Configure these settings.

HTTP Header		
	Header Length	Specifies the maximum acceptable size in bytes of all HTTP header lines. Attack log messages contain `Total Size of All Headers Too Large` when this feature detects a header size buffer overflow attempt.
	Header Name Length	Specifies the maximum acceptable size in bytes of a single HTTP header name (for example, `Host:`, `Content-Type:`, `User-Agent:`).
	Header Value Length	Specifies the maximum acceptable size in bytes of a single HTTP header value.

	Number of Cookies in Request	Specifies the maximum acceptable number of cookies in an HTTP request. Attack log messages contain `Too Many Cookies in Request` when this feature detects a cookie count buffer overflow attempt.
	Number of Ranges in Range Header	Specifies the maximum acceptable number of range: lines in each HTTP header. Attack log messages contain `Too Many Range Headers` when this feature detects too many `Range:` header lines.
	Redundant HTTP Headers	Enable to check whether a HTTP request contains multiple instances of `Content-Length` (only for HTTP/1.x), `Content-Type` (for both HTTP/1.x and HTTP/2) and `Host` (for both HTTP/1.x and HTTP/2) header fields. These header fields are required to appear only once in a request by the RFC. Redundant HTTP headers are most probably involved in possible attacks.
	Illegal Character in Header Name	Enable to check whether the HTTP header name contains illegal characters. Illegal characters in HTTP headers include spaces, non-printable ASCII characters, or other special characters
	Illegal Character in Header Value	Enable to check whether the HTTP header value contains illegal characters. Illegal characters in HTTP headers include spaces, non-printable ASCII characters, or other special characters
HTTP Parameter		
	Total URL Parameter Length	Specifies the total maximum acceptable length in bytes of all parameters, including their names and values, in the URL. Parameters usually appear after a `?`, such as: `/url?`**parameter1=value1&parameter2=value2**. The count does not include: • Question mark (?), ampersand (&), and equal (=) characters are not included. • Parameters in the HTTP body, which can occur with HTTP `POST` requests. Attack log messages contain `Total URL Parameters Length Exceeded` when this feature detects a URL parameter line length buffer overflow attempt.
	Number of URL Parameter	Specifies the maximum number of parameters in the URL. It does **not** include parameters in the HTTP body, which can occur with HTTP `POST` requests. Attack log messages contain `Too Many Parameters in Request` when this feature detects a URL parameter count buffer overflow attempt.
	Maximum URL Parameter Name Length	Specifies the maximum acceptable length in bytes of each URL parameter name in a request. Enable to check whether a parameter name exceeds the limitation (the default is 4096). For example, `user` in the request `GET /index.php?user=test&sid=1234` is an illegal parameter name if you set the limitation as 3.

Maximum URL Parameter Value Length	Specifies the maximum acceptable length in bytes of each URL parameter value in a request. Enable to check whether a parameter value exceeds the limitation (the default is 4096). For example, `1234` in the request `GET /index.php?user=test&sid=1234` is an illegal parameter value if you set the limitation as 3.
Duplicate Parameter Name	Enable to check whether a duplicate parameter name is in the header or body parameters. This protocol constraint will be triggered if: • There are duplicate parameter names in the header. • There are duplicate parameter names in the body. • A parameter name in the header is also in the body.
Illegal Character in Parameter Name	Enable to check whether a URL parameter name contains the characters that are not allowed by the RFC. These illegal characters are usually non-printable ASCII characters or other special characters.
Illegal Character in Parameter Value	Enable to check whether a URL parameter value contains the characters that are not allowed by the RFC. These illegal characters are usually non-printable ASCII characters or other special characters.
HTTP Request	
HTTP Request Filename Length	Specifies the maximum acceptable length in bytes of the HTTP request filename.
Number of Header Lines in Request	Specifies the maximum acceptable number of lines in the HTTP header. Attack log messages contain `Too Many Headers` when this feature detects a header line count buffer overflow attempt.
Null Character in URL	Enable to check whether the URL (or path for HTTP/2) in a request contains null characters (such as `\0` or `%00`). This feature checks the part between the host prefix and parameters in the URL (if they exist), for example, the `/index.php` in `GET http://www.server.com/index.php?name=value HTTP 1.1`. Attackers might embed NULL characters in URL to evade detections.
Illegal Character in URL	Enable to check whether the URL (or path for HTTP/2) in a request contains characters that are not allowed by the RFC. These illegal characters are usually non-printable ASCII characters or other special characters (such as ASCII 0 - 31 and ASCII 127). This feature checks the part between the host prefix and parameters in the URL (if they exist), for example, the `/index.php` in `GET http://www.server.com/index.php?name=value HTTP 1.1`.
Malformed URL	Enable to check whether the URL (or path for HTTP/2) in a request conform the spec by beginning with a slash ("/") character or a slash character follows the protocol prefix and host prefix in the URL (e.g. `http://myserver.com/default.asp`). If the slash characters are missing, it is typically a malicious access to other protocols (e.g. SMTP) using the back-end web servers.
HTTP/2 Max Requests	Enable to specify the maximum acceptable number of requests in an HTTP/2 connection.

	Missing Host	Enable to check if the Host header is missing. For HTTP/2, Missing Host violation appears only when both the Authority and Host headers do not exist
HTTP/2RST		
	HTTP/2 RST Stream	Enable to specify the maximum acceptable number of HTTP/2 RST Streams in an HTTP/2 connection.
	HTTP/2 RST Stream Frequency	Enable to specify the maximum occurrences of the HTTP/2 RST Stream per second.
Content Length		
	Content Length	Specifies the maximum acceptable length in bytes of the request body. Length is determined by comparing this limit with the value of the Content-Length: field in the HTTP header. Attack log messages contain `Content Length Exceeded` when this feature detects a content length buffer overflow attempt.
	Present with Transfer Encoding	Enable to check if `content-length` and `transfer-encoding` coexist.
	Inconsistent with Body Length	Enable to check whether the response has redundant body than the `content-length` specified.
Others		
	Range Overlapping	Enable to detect RangeAmp Overlapping Byte Ranges (OBR) attacks. For more information on this attack, refer to https://www.linuxadictos.com/en/rangeamp-a-series-of-cdn-attacks-that-manipulate-the-range-http-header.html
	Multipart/ form-data Bad Request	Enable to detect whether the multipart request chunk contains the strings "Content-Disposition" and "Name". If it does not, the system will consider it a violation.

3. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner. To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).
Period Block	Block the current request. Moreover, all the subsequent requests from the same client in the next 10 minutes will also be blocked.

4. Click **SAVE**.

URL Access

You can configure URL access rules that define which HTTP requests FortiAppSec Cloud accepts or denies based on their `Host:` name and URL.

To create a URL access rule

1. Go to **ACCESS RULES > URL Access**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Click **+Create Rule**.
3. Configure these settings.

Name	Enter a unique name that can be referenced in other parts of the configuration.
Request URL	Enter a regular expression that matches the target URL. To create a regular expression, see Frequently used regular expressions on page 177.
Action	Select the action that FortiAppSec Cloud takes when it detects a violation of the rule. • **Alert & Deny**—Block the request (or reset the connection) and generate an alert email and/or log message. • **Pass—**Allow the request. Do **not** generate an alert and/or log message. • **Continue—**Continue by evaluating any subsequent rules defined in the web protection profile. If the request does not violate any other rules, FortiAppSec Cloud allows the request. If the single request violates multiple rules, it generates multiple attack log messages.

4. Click **OK**.
   You can continue creating at most 12 URL access rules for an application.

IP Protection

You can block requests from clients based upon their source IP address directly, their current reputation known to FortiGuard, or which country or region the IP address is associated with.

Conversely, you can also exempt clients from scans typically included by the policy.

To configure IP Protection, you must have already enabled this module in **Add Modules**. See How to add or remove a module.

IP reputation

To block the following attacks, you can configure FortiAppSec Cloud to block client access based on up-to-date threat intelligence.

- botnets
- spammers
- phishers
- malicious spiders/crawlers
- virus-infected clients

- clients using anonymizing proxies
- DDoS participants

IP reputation leverages many techniques for accurate, early, and frequently updated identification of compromised and malicious clients so you can block attackers before they target your servers. Data about dangerous clients derives from many sources around the globe, including:

- FortiGuard service statistics
- honeypots
- botnet forensic analysis
- anonymizing proxies
- 3rd party sources in the security community

From these sources, FortiAppSec Cloud compiles a reputation for each public IP address. Clients will have poor reputations if they have been participating in attacks, willingly or otherwise. Because blocking innocent clients is equally undesirable, FortiAppSec Cloud also restores the reputations of clients that have improved their behaviors. This is crucial when an infected computer is cleaned, or in DHCP or PPPoE pools where an innocent client receives an IP address that was previously leased by an attacker.

Check whether an IP address is malicious through FortiGuard IP Web Application Security Service: https://www.fortiguard.com/services/botnet.

If you believe an IP address is wrongly classified as a malicious IP, you can report it to our TAC team.

For help with Geolocation Service and issues, you can find more information at https://www.fortiguard.com/services/ipge, and submit a report at https://www.fortiguard.com/faq/ipge.

Go to **ACCESS RULES > IP Protection** to enable IP Reputation.

Geo IP Block

To configure blocking by geography, select one or more geographical regions that you want to block from the Country list, then click the right arrow or double click the countries to move them to the Selected Country list on the right.

In addition to countries, the Country list also includes distinct territories within a country, such as Puerto Rico, and regions that are not associated with any country, such as Antarctica.

The action taken for the GEO IP violations is Period Block (600 seconds).

Geo IP Exception

Add IP addresses from blocked geographic locations to the exception list so that traffic from those IP addresses is not blocked.

While there is no maximum number of supported IP addresses, the character limit for this list is 1 048 576. Therefore, the number of supported IP addresses will vary depending on their length.

IP list

You can define which source IP addresses are trusted or distrusted clients, or allowed ones.

In **IP List** section, configure these settings.

IP List Input	There are two ways of adding IP list: • **Manually input IP/IP range one by one** Type the client’s source IP address, then click **Add** to add more. You can enter either a single IP address or a range of addresses (for example, 172.22.14.1-172.22.14.255 or 10:200::10:1-10:200:10:100). Each entry should contain only one IP address or IP range. Both IPv4 and IPv6 addresses are supported only on AWS platform currently. **Note:** A maximum number of 30,000 IPs/IP Ranges is supported, 10,000 for each IP/IP Range type. • **Upload a CSV file to add IPs in batch** Click **Upload CSV** to import a CSV file that contains multiple IPs. The type should be one of "BLOCK", "ALLOW","TRUST" . Use the following format for each IP/IP range (enter one IP/IP range per line) in the CSV file: BLOCK,<IP Address> ALLOW,<IP Address> TRUST,<IP Address>-<IP Address>
Type	• **Block IP**—The source IP address that is distrusted, and is permanently blocked from accessing your web servers, even if it would normally pass all other scans. Note: If multiple clients share the same source IP address, such as when a group of clients is behind a firewall or router performing network address translation (NAT), blocking the source IP address could block innocent clients that share the same source IP address with an offending client. • **Trust IP**—The source IP address is trusted and allowed to access your web servers, bypassing any further scanning by subsequent security modules. By default, if the IP address of a request is neither in the Block IP nor Trust IP list, FortiAppSec Cloud will pass this request to other scans to decide whether it is allowed to access your web servers. However, you can define the **Allow Only** list so that such requests can be screened against this list before it's passed to other scans. • **Allow Only**—If the source IP address is in the **Allow Only** list, it will be passed to other scans to decide whether it's allowed to access your web servers. If not, it will be blocked.

	If this list is empty, then the source IP addresses which are not in the Block IP and Trust IP list will be passed directly to other scans. The scan sequence for processing IP addresses is as follows: **Block IP > Trust IP > Allow Only**. For example, if an IP address is present in the **Block IP** list, the system will block it immediately without proceeding to scan against the **Trust IP** and **Allow Only** IP lists. In other words, if an IP address appears in multiple IP lists, it will be processed only against the list which is scanned first. For example, if you wish to trust an IP range but block specific IP addresses within that range, then you can add those IP addresses to the **Block IP** list and the IP range in the **Trust IP** list. This approach will allow the IP range to be trusted while the specified IP addresses are blocked, since the **Block IP** list is scanned first. Requests that are blocked according to the IP Protection lists will receive a warning message as the HTTP response. The warning message page includes **ID: 70007**, which is the ID of all attack log messages about requests from blocked IPs.

Click **SAVE**.

If you have enabled **Use X-Header to Identify Original Clients' IP** in **Rewriting Requests**, the IP address in the header will be identified as the client IP and be scanned by **IP Protection**.

CORS protection

If you have enabled Cross-Origin Resource Sharing (CORS) for your application, the resources of your application can be accessed by other applications using JavaScript within the browser. Use the CORS Protection feature on FortiAppSec Cloud so that only legitimate CORS requests from allowed web applications can reach your application.

To create a CORS protection rule

1. Go to **ACCESS RULES > CORS protection**.
2. Enter a **Request URL** to protect. It can be either:
   - A literal URL, such as `/folder1/index.htm` that the HTTP request must contain in order to match the rule, or use wildcards to match multiple URLs, such as `/folder1/*` or `/folder1/*/index.htm`. The URL must begin with a slash (`/`).
   - A regular expression, such as `^/*.php`. This pattern does not require beginning with a slash (/); however, it must match URLs that begin with a slash.
     To create and test a regular expression, click the **RegEx Test**. This opens the **Regular Expression Validator** window where you can fine-tune the expression. For details, see Frequently used regular expressions.

3. Enable **Block CORS Traffic** to block all the CORS traffic to the above specified URL.
   Disable this option to allow CORS traffic, in the meantime configure the settings below to add restrictions for the CORS traffic.
4. Click **Create New** to add **Allowed Origins**. Configure the following settings.

Protocol	Select which type of protocols is allowed for the connections between foreign applications and your application.
Origin Name	Enter the foreign application's domain name. Wildcards are supported. Please note that the Origin Name only matches with domains in the same level, for example, *.com matches with a.com but not a.b.com; while *.b.com matches with a.b.com.
Port	Type the TCP port number for the CORS connections. The valid range is from 0 to 65,535. 0 means the CORS requests can reach at any TCP port number.
Include Sub Domains	Enable this option so that the **Origin Name** matches with domains of its sub level. For example, if this option is enabled, *.com matches with all domain names.

5. Click **OK**.
6. Configure the following settings.

Allowed Credentials	Specify whether CORS requests from foreign applications can include user credentials. • **None**: Allow CORS requests with or without user credentials. • **TRUE**: Allow only CORS requests with user credentials. The CORS specification requires a specific value for `Access-Control-Allow-Origin` in the response package if the `Access-Control-Allow-Credentials` is true. If you leave the **Allowed Origins** list empty, please be careful to select **TRUE** for **Allowed Credentials** unless you are sure the back-end server will not set `*` for `Access-Control-Allow-Origin` in the response package. • **FALSE**: Allow only CORS requests without user credentials.
Allowed Maximum Age	The maximum time period before the result of a preflight request expires. The valid range is from 0 to 86,400. 0 means using the Allowed Maximum Age configured in the back-end server. For example, if the Allowed Maximum Age is set to 3,600 seconds, and the initial preflight request is allowed, then the subsequent CORS requests in the next 3,600 seconds can be sent directly without a precedent preflight request. This applies only to the CORS preflighted requests, not the simple requests.

Allowed Methods	Click **Add** to add the allowed methods so that FortiAppSec Cloud can verify whether the allowed methods used in the CORS requests are legitimate.
Allowed Headers	Click **Add** to add the allowed headers so that FortiAppSec Cloud can verify whether the headers used in the CORS requests are legitimate.
Exposed Headers	Click **Add** to add the exposed headers so that FortiAppSec Cloud can expose the specified headers in JavaScript and share with foreign applications.

7. Click **Save**.

Bot Mitigation

The AI-based bot detection model complements the existing signature and threshold based rules. It detects sophisticated bots and CC attacks that can sometimes go undetected.

Compared with the traditional mechanisms to detect bots, the ML based bot detection model saves you the trouble to experiment on an appropriate threshold to detect abnormal user behaviors. For example, how could you know how many times of HTTP requests initiated by a user should be considered as abnormal? With the traditional mechanism, you may need to experiment on different threshold values and continuously check the attack log until no related attack logs are reported for the regular traffic.

Things are much easier if you use the ML based bot detection model. FortiAppSec Cloud uses SVM (Support Vector Machine) algorithm to build up the bot detection model that self-learns the traffic profiles of regular clients. When the traffic from a new client flows in, it is compared against that of the regular clients. If they don't match, the bot detection model classifies the new client as an anomaly. When the traffic profiles of the regular clients vary dramatically (e.g. the functions of your application have changed, so that users behave differently when they visit your application),FortiAppSec Cloud automatically refreshes the bot detection model to adapt to the changes.

Moreover, test shows that the bot detection model performs much better, specially when it detects crawlers and scrapers. The traffic is comprehensively evaluated from 13 dimensions. It helps increase the detection accuracy and decrease the false positive rate.

To configure a ML based bot detection rule:

1. Go to **BOT MITIGATION > ML Based Detection (Beta)**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Select the **Model Settings** tab.
3. Configure the following settings.

Client Identification Method	FortiAppSec Cloud collects samples from the real users to build a machine learning model. Select whether to use **IP**, **IP and User-Agent**, or **Cookie** to identify a user. • **IP**: The traffic data in one sample should come from the same source IP. • **IP and User-Agent**: The traffic data in one sample should come from the same source IP and User-Agent (the browser). • **Cookie**: The traffic data in one sample should have the same cookie value.
Model Type	Multiple models are built during the model building stage. The system uses training accuracy, cross-validation value, and testing accuracy to select qualified models. The **Model Type** is used to select the one final model out of all the qualified models. • If you configure the Model Type to **Moderate**, the system chooses the model which has the **highest** training accuracy among all the qualified models. • If you configure the Model Type to **Strict**, the system chooses the model which has the **lowest** training accuracy among all the qualified models.

	The Strict Model has a higher likelihood of identifying anomalies, but also carries the risk of incorrectly identifying regular users as bots. The Moderate Model is relatively lenient making it less prone to false positive detections, but comes with the risk of allowing actual bots to go undetected. There isn't a perfect option for every situation. Whichever model type you choose, you can always leverage the options in **Anomaly Detection Settings** and **Action Settings** to mitigate the side effects, for example, using **Bot Confirmation** to avoid false positive detections.
Anomaly Count	If the system detects certain times of anomalies from a user, it takes actions such as sending alerting emails or blocking the traffic from this user. **Anomaly Count** controls how many times of anomalies are allowed for each user. For example, the Anomaly Count is set to 4, and the system has detected 3 anomalies in the last 6 samples. If the 7th sample is detected again as an anomaly, the system will take actions. Please note that if no valid traffic is collected for the 7th sample (for example, the user leaves your application), the system will clear the anomaly count and the user information. If the user revisits your application, he/she will be treated as new users and the system starts anomaly counting afresh. Since this option allows certain times of anomalies from a user, it might be a good choice if you want to avoid false positive detections.
Challenge	If a bot is detected, the system will use the following methods to confirm it's indeed a bot. • **Real Browser Enforcement**: The system sends a JavaScript to the client to verify whether it is a web browser. • **CAPTCHA Enforcement**: The system requires clients to successfully fulfill a CAPTCHA request. It will trigger the action policy if the traffic is not from web browser.
Block Duration	Enter the number of seconds that you want to block the requests. The valid range is 1–3,600 seconds (1 hour). This option only takes effect when you choose **Period Block** in **Action**.
Source IP List	Click **Create New** to list the source IP ranges of the samples. FortiAppSec Cloud will collect samples from the specified IP ranges.
Exception URLs	Due to the nature of some web pages, such as the stock list web page, even regular users may behave like bots because they tend to frequently refresh the pages. You may need to add these URLs in the exception list, otherwise the model may be invalid because too many bot-like behaviors are recorded in the samples. Click **Create New** to list exception URLs. The system will collect samples for any URL except the ones in the **Exception URLs** list.

4. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.
   To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate a log message.

Alert & Deny	Block the request (or reset the connection) and generate a log message.
Period Block	Block the current request. Moreover, all the subsequent requests from the same client in the next 10 minutes will also be blocked.
Deny (no log)	Block the request (or reset the connection) without generating a log message.

5. Click **SAVE**.

Known Bots

Configuring Known Bots protects your websites, mobile applications, and APIs from known malicious bots (e.g., DoS, Spam, Crawlers) while allowing activity from beneficial bots like search engines. This ensures both security and the smooth flow of essential traffic.

This feature identifies and manages a wide range of attacks from automated tools no matter where these applications or APIs are deployed.

To configure Known Bots rule

1. Go to **BOT MITIGATION > Known Bots**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Configure these settings.
3.

Known Bad Bots	Enable to take the configured action against bad bots using predefined signatures. Click the **Edit** icon on each Bot List if you want specific bots to be exempted. The signatures moved to the **Allowed List** will not be screened against.
Known Good Bots	Enable to take the configured action on known good bots (we recommend configuring bypass or alert for this option). By default, all popular predefined search engines (Google, Bing, Yahoo, etc.) are on the **Selected List**. Click the **Edit** icon on each Bot List if you want specific bots to be exempted. The search engines moved to the **Unselected List** will not be screened against.

4. Select the action that FortiAppSec Cloud takes when it detects a Known Good or Bad Bot.
   To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Bypass	Accept the request with no generated log or alert.
Alert	Accept the request and generate an alert email and/or log message
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).
Period Block	Block the current request. Moreover, all the subsequent requests from the same client in the next 10 minutes will also be blocked.

5. Click **SAVE**.

Threshold Based Detection

With the occurrence, time period, and severity of the following suspicious behaviors predefined, FortiAppSec Cloud judges whether the request comes from a human or a bot.

- Known Bad Bots
- Known Search Engines
- Crawler
- Vulnerability Scanning
- Slow Attack
- Content Scraping
- Credential Based Brute Force

To configure Threshold Based Detection:

1. Go to **BOT MITIGATION > Threshold Based Detection**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Configure these settings.

Crawler	Enable to detect web crawlers that are usually used to map out your application structure. If 403 and 404 response codes occur more than 100 times within 10 seconds, FortiAppSec Cloud will take actions.
Vulnerability Scanning	Enable to detect tools that scan your application for vulnerabilities. If attack signatures are triggered more than 100 times within 10 seconds, FortiAppSec Cloud will take actions.
Slow-Attack	Enable to detect automatic tools that try to go undetected by generating traffic in low thresholds. If the timeout HTTP Transaction occurs more than 5 times within 100 seconds, FortiAppSec Cloud will take actions.
Content-Scraping	Enable to detect malicious tools that try to download large amounts of content such as text/html and application/xml from your web site. If the download activity occurs more than 100 times within 30 seconds, FortiAppSec Cloud will take actions.
Credential Based Brute Force	Enable to block brute force attacks that try to obtain user credentials by detecting whether a user is accessing a specific URL too frequently after logging in. To enable Credential Based Brute Force, Account Takeover on page 142 must also be enabled. Please note, this feature only tracks users who have successfully logged in and can thus be monitored by Account Takeover.
Request URL	The URL that you want to protect from brute force login. Here we only support **Regular Expression Match**. The value does not require a forward slash (/). However, ensure that it can match values that contain a forward slash. For details, see Frequently used regular expressions on page 177. Only available when Credential Based Brute Force is enabled.
Occurrence **Within**	When the brute force login occurs more than a certain times in a certain time period, FortiAppSec Cloud will periodically block the request. The Occurrence defines "how many times", while the Within (Seconds) defines the "time period". Only available when Credential Based Brute Force is enabled.
Challenge	You can select among: • **Disable**—Disables this option to not to challenge users when a rule is triggered.

- **Real Browser Enforcement**—Specifies whether FortiAppSec Cloud returns a JavaScript to the client to test whether it is a web browser or automated tool when it meets any of the specified conditions. If the client fails the test or does not return results in 20 seconds, FortiAppSec Cloud applies specified actions. If the client appears to be a web browser, FortiAppSec Cloud allows the client to exceed the action.
- **CAPTCHA Enforcement**—Requires the client to successfully fulfill a CAPTCHA request. If the client cannot successfully fulfill the request within 3 times or doesn't fulfill the request within 20 seconds, FortiAppSec Cloud applies related actions and sends the CAPTCHA block page.

Note: Configurable only when either of Crawler, Vulnerability Scanning, Slow Attack, or Content Scraping is enabled.

3. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.
   To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

   The default action for Threshold Based Detection is Period Block. It is not recommended to change this configuration.

   For Threshold Based Detection, Period Block is the most reasonable action to take. When the count of suspicious behaviors reaches the threshold and triggers the Period Block action, all the subsequent requests from the suspected IP address in the next 10 minutes will be blocked, while if the action is Alert & Deny or Deny (no log), only the request that hits the threshold will be denied, and the subsequent requests will be let go until the threshold count is hit again.

Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).
Period Block	Block the current request. Moreover, all the subsequent requests from the same client in the next 10 minutes will also be blocked.

4. Click **SAVE**.

Bot Mitigation

The AI-based bot detection model complements the existing signature and threshold based rules. It detects sophisticated bots and CC attacks that can sometimes go undetected.

Compared with the traditional mechanisms to detect bots, the ML based bot detection model saves you the trouble to experiment on an appropriate threshold to detect abnormal user behaviors. For example, how could you know how many times of HTTP requests initiated by a user should be considered as abnormal? With the traditional mechanism, you may need to experiment on different threshold values and continuously check the attack log until no related attack logs are reported for the regular traffic.

Things are much easier if you use the ML based bot detection model. FortiAppSec Cloud uses SVM (Support Vector Machine) algorithm to build up the bot detection model that self-learns the traffic profiles of regular clients. When the traffic from a new client flows in, it is compared against that of the regular clients. If they don't match, the bot detection model classifies the new client as an anomaly. When the traffic profiles of the regular clients vary dramatically (e.g. the functions of your application have changed, so that users behave differently when they visit your application),FortiAppSec Cloud automatically refreshes the bot detection model to adapt to the changes.

Moreover, test shows that the bot detection model performs much better, specially when it detects crawlers and scrapers. The traffic is comprehensively evaluated from 13 dimensions. It helps increase the detection accuracy and decrease the false positive rate.

To configure a ML based bot detection rule:

1. Go to **BOT MITIGATION > ML Based Detection (Beta)**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Select the **Model Settings** tab.
3. Configure the following settings.

Client Identification Method	FortiAppSec Cloud collects samples from the real users to build a machine learning model. Select whether to use **IP**, **IP and User-Agent**, or **Cookie** to identify a user. • **IP**: The traffic data in one sample should come from the same source IP. • **IP and User-Agent**: The traffic data in one sample should come from the same source IP and User-Agent (the browser). • **Cookie**: The traffic data in one sample should have the same cookie value.
Model Type	Multiple models are built during the model building stage. The system uses training accuracy, cross-validation value, and testing accuracy to select qualified models. The **Model Type** is used to select the one final model out of all the qualified models. • If you configure the Model Type to **Moderate**, the system chooses the model which has the **highest** training accuracy among all the qualified models. • If you configure the Model Type to **Strict**, the system chooses the model which has the **lowest** training accuracy among all the qualified models. The Strict Model has a higher likelihood of identifying anomalies, but also carries the risk of incorrectly identifying regular users as bots. The Moderate Model is relatively lenient making it less prone to false positive detections, but comes with the risk of allowing actual bots to go undetected. There isn't a perfect option for every situation. Whichever model type you choose, you can always leverage the options in **Anomaly Detection Settings** and **Action Settings** to mitigate the side effects, for example, using **Bot Confirmation** to avoid false positive detections.
Anomaly Count	If the system detects certain times of anomalies from a user, it takes actions such as sending alerting emails or blocking the traffic from this user. **Anomaly Count** controls how many times of anomalies are allowed for each user.

	For example, the Anomaly Count is set to 4, and the system has detected 3 anomalies in the last 6 samples. If the 7th sample is detected again as an anomaly, the system will take actions. Please note that if no valid traffic is collected for the 7th sample (for example, the user leaves your application), the system will clear the anomaly count and the user information. If the user revisits your application, he/she will be treated as new users and the system starts anomaly counting afresh. Since this option allows certain times of anomalies from a user, it might be a good choice if you want to avoid false positive detections.
Challenge	If a bot is detected, the system will use the following methods to confirm it's indeed a bot. • **Real Browser Enforcement**: The system sends a JavaScript to the client to verify whether it is a web browser. • **CAPTCHA Enforcement**: The system requires clients to successfully fulfill a CAPTCHA request. It will trigger the action policy if the traffic is not from web browser.
Block Duration	Enter the number of seconds that you want to block the requests. The valid range is 1–3,600 seconds (1 hour). This option only takes effect when you choose **Period Block** in **Action**.
Source IP List	Click **Create New** to list the source IP ranges of the samples. FortiAppSec Cloud will collect samples from the specified IP ranges.
Exception URLs	Due to the nature of some web pages, such as the stock list web page, even regular users may behave like bots because they tend to frequently refresh the pages. You may need to add these URLs in the exception list, otherwise the model may be invalid because too many bot-like behaviors are recorded in the samples. Click **Create New** to list exception URLs. The system will collect samples for any URL except the ones in the **Exception URLs** list.

4. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner. To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate a log message.
Alert & Deny	Block the request (or reset the connection) and generate a log message.
Period Block	Block the current request. Moreover, all the subsequent requests from the same client in the next 10 minutes will also be blocked.
Deny (no log)	Block the request (or reset the connection) without generating a log message.

5. Click **SAVE**.

Biometrics Based Detection

By checking the client events such as mouse movement, keyboard, screen touch, and scroll, etc in specified period, FortiAppSec Cloud judges whether the request comes from a human or from a bot.

1. Go to **BOT MITIGATION > Biometrics Based Detection**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Configure these settings.

Monitor Client Events	Select at least one client event according to your need. • Mouse Movement • Click • Keyboard • Screen Touch • Scroll
Event Collection Period	Specify the time period that the events will be collected from the client.
Bot Effective Time	For the identified bot, choose the time period before FortiAppSec Cloud tests and verifies the bot again.

3. Click **+Create Rule**.
4. For **URL**, enter the literal URL, such as `/index.php`, or a regular expression, such as `^/*.php` that the HTTP request must contain in order to match the rule. Multiple URLs are supported.
5. Click **OK**.
6. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.
   To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).

7. Click **SAVE**.

Bot Deception

To prevent bot deception, you can configure to insert link into HTML type response pages. For regular clients, the link is invisible, while for malicious bots like web crawler, they may request the resources which the invisible link points at.

To configure bot deception

1. Navigate to **WAF> Application > Bot Mitigation > Bot Deception**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. For **Deception URL**, specify the deception URL to be inserted in the HTML response page, which can be either an absolute path or a relative path.
3. Click **+Create Rule** to enter the literal URL, such as `/index.php`, or a regular expression, such as `^/*.php` that the HTTP request must contain in order to match the rule. Multiple URLs are supported.
4. Click **OK**.

5. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner. To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

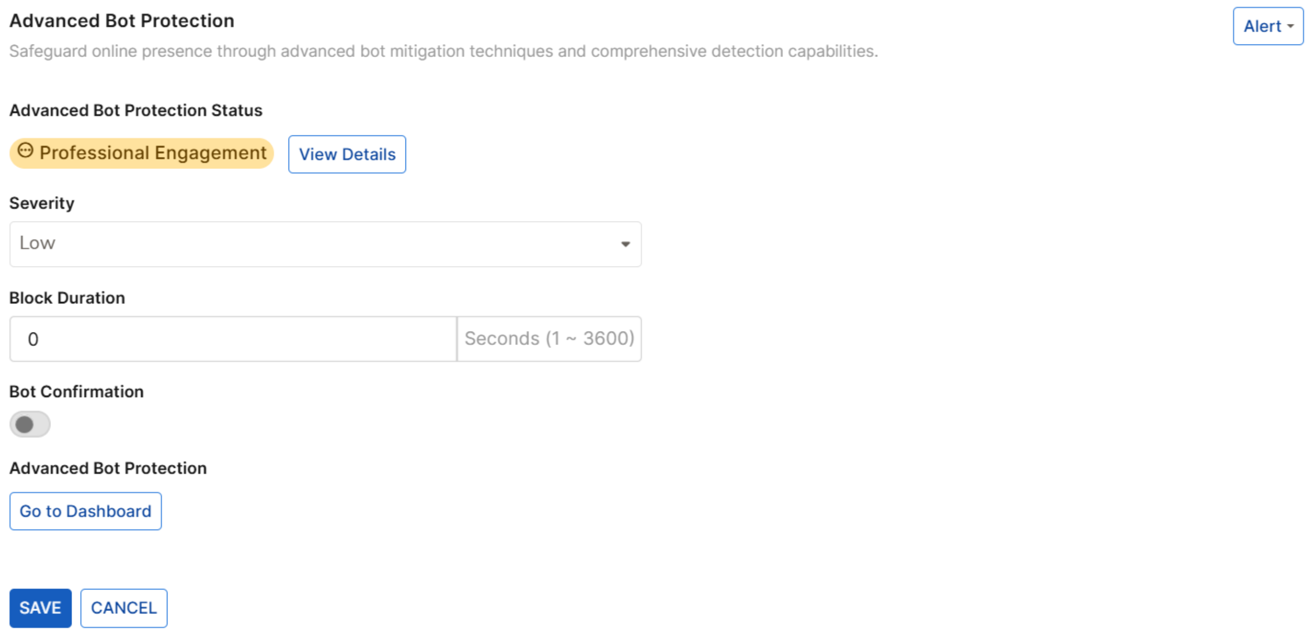
Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).
Period Block	Block the current request. Moreover, all the subsequent requests from the same client in the next 10 minutes will also be blocked.

6. Click **SAVE**.

Advanced Bot Protection

WAF integrates with ABP, allowing users to leverage deep learning algorithms and behavior analysis to detect and block sophisticated bots. It analyzes user behavior patterns, device fingerprints, and other indicators to differentiate between legitimate users and malicious bots.

For more information on the features and capabilities of ABP, please see Advanced Bot Protection on page 193.



Advanced Bot Protection

Safeguard online presence through advanced bot mitigation techniques and comprehensive detection capabilities.

Advanced Bot Protection Status

Professional Engagement

Severity: Low

Block Duration: 0 Seconds (1 ~ 3600)

Bot Confirmation

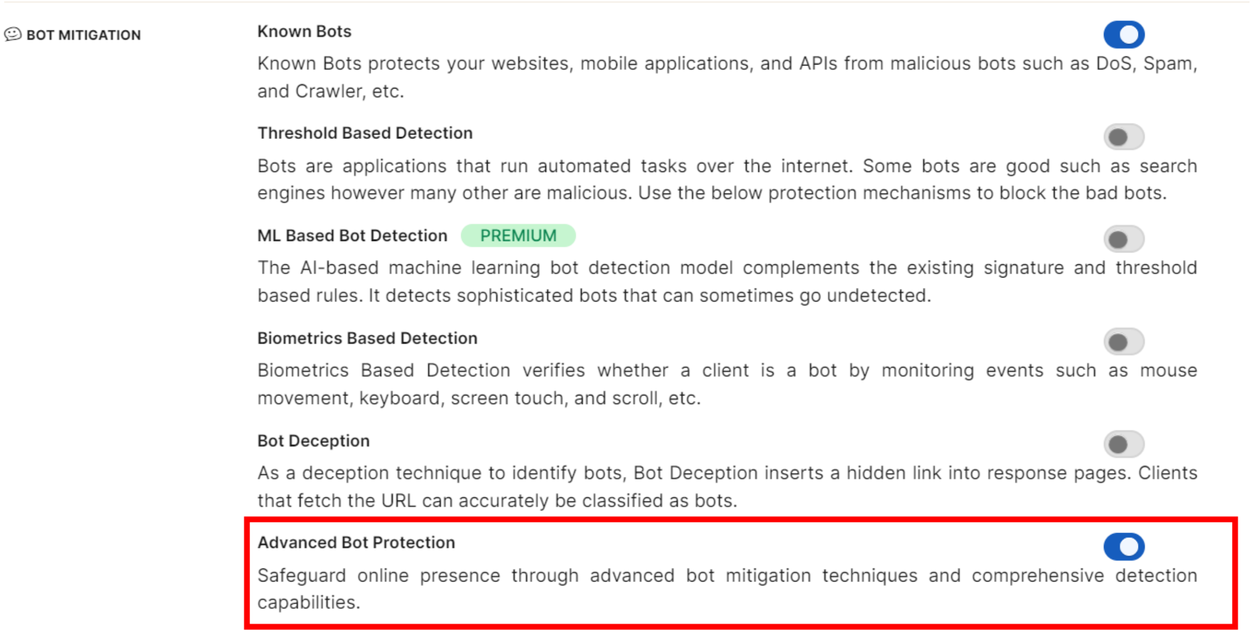
Set up Advanced Bot Protection (ABP)

Prerequisites

- A valid ABP license.
  For license inquiries, please contact the sales team.

Enable ABP module on WAF

1. Log into your FortiAppSec Cloud web portal.
2. In the side navigation menu, click **Add Modules**.
3. Scroll down to **Bot Mitigation**, and enable **Advanced Bot Protection**.



BOT MITIGATION

Known Bots
Known Bots protects your websites, mobile applications, and APIs from malicious bots such as DoS, Spam, and Crawler, etc.

Threshold Based Detection
Bots are applications that run automated tasks over the internet. Some bots are good such as search engines however many other are malicious. Use the below protection mechanisms to block the bad bots.

ML Based Bot Detection PREMIUM
The AI-based machine learning bot detection model complements the existing signature and threshold based rules. It detects sophisticated bots that can sometimes go undetected.

Biometrics Based Detection
Biometrics Based Detection verifies whether a client is a bot by monitoring events such as mouse movement, keyboard, screen touch, and scroll, etc.

Bot Deception
As a deception technique to identify bots, Bot Deception inserts a hidden link into response pages. Clients that fetch the URL can accurately be classified as bots.

Advanced Bot Protection
Safeguard online presence through advanced bot mitigation techniques and comprehensive detection capabilities.

4. Click **OK. Advanced Bot Protection** (ABP) should now show up in your side navigation menu.
5. Navigate to **Bot Mitigation > Advanced Bot Protection**.
   The content shown on this page is determined by the status of your ABP license.
   - If you do not have a valid ABP license, you will be guided to obtain one.
     If you have a valid license, this page will display the following information regarding your application:

When you have a valid ABP license, enabling **Advanced Bot Protection** on WAF will automatically generate a corresponding application on ABP if one has not been previously created for the application.

Action	Select the action FortiAppSec Cloud takes when ABP detects bot activity: • **Alert** — Accept the request and generate an alert email and/or log message. • **Alert & Deny** — Block the request (or reset the connection) and generate an alert email and/or log message. • **Deny (no log)** — Block the request (or reset the connection) and do not generate an alert email and/or log message. • **Period Block** —Block the current request, and any subsequent requests from the same client will be blocked for a configurable period of time, as defined by the **Block Duration** setting.
Advanced Bot Protection Status	The current state or condition of the ABP service for your application.

	Initially "Pending" after creation, it transitions to "Ready" when the PET team finishes configurations and provisioning. For more information on this process, please refer toAdvanced Bot Protection on page 193.
Severity	Select the event severity to log when a bot is detected: • **High** — Log as high severity events. • **Medium** — Log as a medium severity events. • **Low** — Log as low severity events. • **Informative** — Log as informative security events. This security level indicates a low-priority event that does not pose a significant security risk, and is useful for tracking and monitoring purposes but do not require immediate action. The default is **Low**.
Block Duration	The duration (in seconds) to block a client after ABP detects bot-like behavior. This feature is only configurable when **Action** is set to **Period Block**.
Bot Confirmation	When enabled, your application will send bot verification requests to clients. **Verification Method:** The type of verification request. Currently, only CAPTCHA is available, so this option cannot be changed. **Max Attempt Times:** The maximum number of attempts to allow a client to respond to the verification request before the request is considered a failure. **Validation Timeout:** The elapsed time (in seconds) after which the verification request is considered a failure.
Go to Dashboard	A link that takes you to the ABP dashboard. This feature may be restricted depending on the level of access on your account's permission profile.

DDoS prevention

Connection Limits

FortiAppSec Cloud DDoS prevention Connection Limits is a service that protects you against DDoS high-volume attacks.

A Distributed Denial of Service attack (DDoS attack) is a cyber attack in which an attacker attempts to overwhelm a web server/site, making its resources unavailable to its intended users. Most DDoS attacks use automated tools (not browsers) on one or more hosts to generate the harmful flood of requests to a web server.

FortiAppSec Cloud allows you to configure Connection Limits at two layers:

- Application layer (HTTP or HTTPS)
- Network and transport layer (TCP/IP)

With the public cloud infrastructure affront providing the first layer of defense against volumetric attacks, FortiAppSec Cloud enhances DDoS protection by focusing on sophisticated attacks targeting the application layer, such as low and slow attacks. Together they provide protection for the full layer 3-7 DDoS attack types. Additionally, Fortinet operations team also adds network and application protection customizations in real-time to help protect against the most sophisticated DDoS threats.

To configure **DDoS prevention Connection Limits** , you must have already enabled this module in **Add Modules.** See Add and Remove Modules.

Configuring application-layer DDoS prevention Connection Limits

For some DDoS prevention Connection Limits features, FortiAppSec Cloud uses session management to track requests.

1. When FortiAppSec Cloud receives the first request from any client, it adds a session cookie to the response from the web server in order to track the session. The client will include the cookie in subsequent requests.
2. If a client sends another request before the session timeout, FortiAppSec Cloud examines the session cookie in the request.
   - If the cookie does not exist or its value has changed, FortiAppSec Cloud drops the request.
   - If the same cookie exists, the request is treated as part of the same session. FortiAppSec Cloud increments its count of connections and/or requests from the client. If the rate exceeds the limit, FortiAppSec Cloud drops the extra connection or request.

You can configure settings below to limit the number of HTTP requests and TCP connections.

HTTP Access Limit	Enable to limit the number of HTTP requests per second from a certain IP.
HTTP Request Limit	Type a rate limit for the maximum number of HTTP requests per second from each source IP address that is a single HTTP client. For example, if loading a web page involves: • 1 HTML file request • 1 external JavaScript file request

	- 3 image requests The rate limit should be at least 5, but could be some multiple such as 10 or 15 in order to allow 2 or 3 page loads per second from each client. It's recommended to use an initial value of 1000.
Malicious IPs	Enable to limit the number of TCP connections with the same session cookie.
TCP Connection Number Limit	Type the maximum number of TCP connections allowed with a single HTTP client. It's recommended to use an initial value of 100.
HTTP Flood Prevention	Enable to limit the number of HTTP connections with the same session cookie.
HTTP Request Limit	Type the maximum rate of requests per second allowed from a single HTTP client. It's recommended to use an initial value of 500.
Challenge	- **Real Browser Enforcement**—Specifies whether FortiAppSec Cloud returns a JavaScript to the client to test whether it is a web browser or automated tool when it meets any of the specified conditions. - **CAPTCHA Enforcement**—Requires the client to successfully fulfill a CAPTCHA request.

Configuring network-layer Connection Limits

You can limit the number of fully-formed TCP connections per source IP address. FortiAppSec Cloud counts TCP connections. This effectively prevents TCP floodstyle denial-of-service (DoS) attacks.

Configure the settings below.

TCP Flood Prevention	Enable to limit the number of TCP connections from the same source IP address.
TCP Connection Number Limit	Type the maximum number of TCP connections allowed with a single source IP address.
Block Duration	Type the number of seconds that you want to block subsequent requests from the client after FortiAppSec Cloud detects that the client has violated the rule.

Click **SAVE**.

Configuring actions

1. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner. To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.

Deny(no log)	Block the request (or reset the connection).
Period Block	Block the current request. Moreover, all the subsequent requests from the same client in the next 10 minutes will also be blocked.

Advanced Applications

With this module, you can configure XML protection to ensure no potential attacks in requests containing XML; also, you can configure FortiAppSec Cloud to secure WebSocket traffic with various security controls.

- Custom Rule
- WebSocket Security

Custom Rule

Custom Rule provides advanced access control capabilities to match complex conditions specific to your web application.

You use the rule's filters to specify all criteria that you require allowed traffic to match.

The filters apply to request traffic only, with the following exceptions:

- **HTTP Response Code** and **Content Type** apply to responses.
- **Signature Violation** applies to either requests or responses, depending on which signatures you enable.
- **Occurrence** applies to either requests or responses.

To create a custom rule

1. Go to **ADVANCED APPLICATIONS > Custom Rule**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Click **+Create Rule**.
3. Configure these settings.

Name	Type a unique name for the custom rule.
Operation	Select which action the FortiAppSec Cloud will take when it detects a violation of the rule: • **Deny**—Block the request (or reset the connection). • **Deny (no log)**—Block the request (or reset the connection) without generating a log message. • **Period Block**—Block the current request. Moreover, all the subsequent requests from the same client in the next 10 minutes will also be blocked.
Challenge	Choose how to challenge users when a custom rule is triggered. • **Disable**—Disable this option to not to challenge users when a rule is triggered. • **Real Browser Enforcement**—Specifies whether FortiAppSec Cloud returns a JavaScript to the client to test whether it is a web browser or automated tool when it meets any of the specified conditions. If the client fails the test or does not return results in 20 seconds, FortiAppSec Cloud applies specified actions. If the client appears to be a web browser, FortiAppSec Cloud allows the client to exceed the action. • **CAPTCHA Enforcement**—Require the client to successfully fulfill a CAPTCHA request. If the client cannot successfully fulfill the request within 3 times or doesn't fulfill the request within 20 seconds, FortiAppSec

	Cloud applies related actions and sends the CAPTCHA block page.

4. Click **ADD FILTER** to select the filter types.
5. Configure these settings.

Filter Type	Select the filter types that a request must match in order not to be allowed, and configure their settings respectively.
Source IP	The request containing the IP/IP Range will not be allowed. • **IP/IP Range**—Type the IP address of a client that is not allowed. You can enter either a single IP address or a range of addresses (for example, 172.22.14.1-172.22.14.255 or 10:200::10:1-10:200:10:100). Each entry should contain only one IP address or IP range. Both IPv4 and IPv6 addresses are supported only on AWS platform currently. • **Reverse Matching**—Once enabled, only the specified IP/IP range will be allowed by FortiAppSec Cloud.
User	The request containing the user name will not be allowed. • **User Name**—Enter a user name captured in Account Takeover module to match. You must enable Account Takeover module for this user type. • **Reverse Matching**—Once enabled, the request containing the specified user name will be allowed by FortiAppSec Cloud.
URL	The request matching the specified URL will not be handled. • **URL Pattern**—Type a regular expression that matches one or more URLs, such as `/index\.jsp`. • **Reverse Matching**—Once enabled, only the specified URL will be handled.
Parameter	The request containing specified Name Pattern and Value Pattern will not be handled. • **Name Pattern**—Define the name pattern of a parameter using regular expression. • **Value Pattern**—Define the value pattern of a parameter using regular expression.
HTTP Header	The request matching all or part of the specified HTTP header name values will not be handled. • **HTTP Header**—Indicate a single HTTP Header Name such as `Accept:`, and all or part of its value in Value Pattern. ◦ **Predefined Header** **Header Name**—Select a single HTTP header name from the drop down list. **Value Pattern**—Define the value pattern using regular expression. **Reverse Matching**—Once enabled, the request that matches the specified value pattern will be handled. **Missing Header Name**—Once enabled, the request matches the condition if it does not contain the specified header. This setting cannot be enabled at the same time as **Empty Header Value Check**. Please note that this setting does not take effect for HTTP2 packets without the following headers:

	• :method • :scheme • :path • :authority • :status HTTP2 packets without the above headers will not go far to be scanned against the custom rule settings. It will be considered as illegitimate and be abandoned directly when it arrives at FortiWeb at the first place. **Empty Header Value Check**—Once enabled, the request matches the condition if it contains the specified header but the value of the matched header is empty. This setting cannot be enabled at the same time as **Missing Header Name**. ◦ **Custom Header** **Name Pattern**—Define the name pattern of a single HTTP header name. **Value Pattern**—Define the value pattern using regular expression. **Reverse Matching**—Once enabled, the request will be handled if the HTTP header contains the regular expression. **Missing Header Name**—Once enabled, the request matches the condition if it does not contain the specified header. This setting cannot be enabled at the same time as **Empty Header Value Check**. Please note that this setting does not take effect for HTTP2 packets without the following headers: • :method • :scheme • :path • :authority • :status HTTP2 packets without the above headers will not go far to be scanned against the custom rule settings. It will be considered as illegitimate and be abandoned directly when it arrives at FortiWeb at the first place. **Empty Header Value Check**—Once enabled, the request matches the condition if it contains the specified header but the value of the matched header is empty. This setting cannot be enabled at the same time as **Missing Header Name**. • **HTTP Method** ◦ **Method Pattern**—Configure a regular expression for the HTTP method that FortiAppSec Cloud will search for in the header field. ◦ **Reverse Matching**—Once enabled, the request will be handled if the HTTP header contains the HTTP method's regular expression.
Content Type	The request will not be handled if an HTTP response for a file matches one of the specified types. Use icons and to add or remove the content types to or from the Allow Content Types list.

HTTP Response Code	The request will not be handled if a HTTP response code matches the specified code or range of codes. • **Code**—Enter a response code or code range. For example, `404` or `500-503`.
Known Attacks	The request will not be handled if FortiAppSec Cloud detects selected attack signature categories in the request or response. • Cross Site Scripting • SQL Injection • Generic Attacks • Known Exploits • Trojans Refer to Known Attacks for information about the attacks above.
Access Rate Limit	The request will not be handled if the number of requests per second per client IP exceeds the specified value. • **Request per Second**—Enter a value to indicate the number of requests per second per client IP.
Packet Interval Timeout	The request will not be handled if the time period between packets arriving from either the client or server (request or response packets) exceeds the specified value in seconds. • **Timeout**—Enter a value to indicate the time period between packets arriving from either the client or server.
Transaction Timeout	The request will not be handled if the lifetime of a HTTP transaction exceeds the specified transaction timeout. • **Timeout**—Enter a value in seconds to indicate the lifetime of a HTTP transaction.
Occurrence	The request will not be handled if a transaction matches other filter types in the current rule at a rate that exceeds the specified threshold. • **Occurrence**—Enter a rate that a transaction matches other filter types. • **Within**—Enter a time period in seconds for the occurrence.
Time Period	The request will not be handled if the time period of the request matches what you specify. • **Type**—Select Daily or Once for the time period. • **Time Period**—Enter a time period.

Note: Two colors green and yellow are adapted to classify the filter types; green means filtering HTTP traffic, include Source IP, URL, Parameter, HTTP Header, HTTP Response Code, and Content Type; while yellow is related to security, including Security Rules, Packet Interval Timeout, Transaction Timeout, and Occurrence.

6. Click **OK**.
   You can continue creating at most 12 custom rules for an application.
7. You can click to edit, reorder, or remove each created rule.

WebSocket Security

WebSocket Protocol is a TCP-based network protocol, which enables full-duplex communication between a web browser and a server.

FortiAppSec Cloud now secures WebSocket traffic with a variety of security controls such as allowed formats, frame and message size and signature detection.

You can create WebSocket security rules to detect traffic that uses the WebSocket TCP-based protocol.

To create a WebSocket security rule

1. Go to **ADVANCED APPLICATIONS > XML Protection**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Click **+Add WebSocket Security Rule**.
3. Configure these settings.

Name	Type a name that can be referenced by other parts of the configuration.
Request URL	Enter the literal URL, such as `/index.php`, that the HTTP request must contain in order to match the rule.
Allow WebSocket	Enable to detect the WebSocket traffic, and FortiAppSec Cloud will check any WebSocket related traffic. The following fields can be configured only when this option is enabled.
Allow Formats	When the WebSocket connection is established , data is transmitted in the form of frame. Select the allowed frame formats that are acceptable matches. By default, both **Plain Text** and **Binary** are checked.
Max Frame Size	Specify the maximum acceptable frame header and body size in bytes. The valid range is 0–2147483647 bytes.
Max Message Size	Specify the maximum acceptable message header and body size in bytes. The valid range is 0–2147483647 bytes.
Block Extensions	Enable to not check the extension header in WebSocket handshake packet. By default, this option is disabled.
Block Known Attacks	Enable to protect against known attacks, common vulnerabilities and exposures (CVEs), and other exploits as part of the OWASP Top 10.

4. Enter the allowed origin.
   For example, `121.40.165.18:8800`. Only traffic from the allowed origins can be accepted. You can add multiple origins here.
5. Click **OK**.
   You can create at most 12 WebSocket security rules for an application.

To configure actions

1. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.
   To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate an alert email and/or log message.

Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).

2. Click **SAVE**.

API Protection

FortiAppSec Cloud secures your API interfaces that are implemented using XML, JSON API, or OpenAPI.

Depending on how your API interfaces are implemented, you can use **OpenAPI Validation**, **JSON Protection**, or **XML Protection** to import a schema/validation file defining how a client should request the resources being fetched or modified. FortiAppSec Cloud parses the contents of each API call against the schema/validation file and take appropriate actions to protect you from malicious traffic.

FortiAppSec Cloud has the ability to manage API users, verify API keys, control API access and rate limits, etc. It can also check whether the request initiated from a mobile device carries a JWT-token header and whether the token is valid. These settings are available in **API Gateway** and **Mobile API Protection**.

- ML Based API Protection
- OpenAPI Validation
- JSON Protection
- XML Protection
- Mobile API Protection
- API Gateway

ML Based API Protection

The AI-based API Protection builds mathematical models for Schema Protection and Threat Protection. The Schema Protection model learns the REST API data structure from user traffic samples and then compiles a schema file to screen out malformed API requests. The Threat Protection model learns the patterns of the parameter value in the API request body and then builds models to screen out requests which have abnormal values in its body.

Model Settings

To configure an API Protection rule:

1. Go to **API PROTECTION > ML Based API Protection**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Select the **Model Settings** tab.
3. Based on the samples collected, the system learns the patterns of the parameter value in the API request body and then builds **Threat Protection** models to screen out requests which have abnormal values in their body.
   Select the action to take when abnormal parameter values are detected:
   - **Alert:** Accept the request and generate a log message.
   - **Alert&Deny:** Block the request (or reset the connection) and generate a log message.
   - **Standby:** Do not take any action.

   Please note that in addition to the Threat Protection model that screens out API requests with abnormal parameter values, the system also builds an Schema Protection model to detect API requests which are malformed. It compiles an API schema file and screens out malformed API requests against the schema file. The Schema Protection data can be viewed in the **API Collection** tab.
4. Configure the Data Collection Settings.

IP List Type	• **Trust**: FortiAppSec Cloud collects API request samples only from the

	Trust source IP addresses. • **Block**: FortiAppSec Cloud collects API request samples from all source IP addresses except the ones in the **Block** list. If the IP List Type is **Trust** and the **Source IP List** is empty, FortiAppSec Cloud will not collect samples from any Source IP address. If the IP List Type is **Block** and the **Source IP List** is empty, FortiAppSec Cloud will collect samples from all Source IP addresses. The IP list only restricts where the samples come from. Once the model is built, requests from other source IP addresses will also be scanned by the IP Protection model.
Source IP List	Click **Create New** to add the source IP list. This option is used together with **IP List Type**.
API Learning Patterns	If you want to limit the API protection learning to certain API paths, click **Create New** in the **API Learning Patterns** section, then enter either a string match API path or regular expression. Please note that only the specified API paths will be protected by the API Protection module.

API Collection

To view and edit API paths learned by the Schema Protection model:

1. Go to **API PROTECTION > ML Based API Protection**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Select the **API Collection** tab. This page lists all the API paths learned by machine learning model.
   Please note that the default action for Schema Protection is **Standby**. You can click into each API path and change the action.
3. Click the Edit icon on the API path row to view and edit the parameter, request body, and response body learned by the model.
4. Select the action to take when malformed API request to this API path is detected.
   - **Alert:** Accept the request and generate a log message.
   - **Alert&Deny:** Block the request (or reset the connection) and generate a log message.
   - **Standby:** Do not take any action.
5. Click the **Parameter** tab under **Request** section, check the parameters learned by the machine learning model. If some parameters are missing, you can click **Create Parameter** to add them.
   If you don't want certain parameter to be protected, click the **Remove** icon on the corresponding parameter row.
6. To edit the parameter, click the **Edit** icon of the parameter to be edited. Configure the following settings.

Name	Enter a name for the parameter.
Description	Enter a brief description for this parameter.
In	Currently FortiAppSec Cloud only support adding the query parameters in API schema. The path parameters in API schema is not supported yet.
Required	**True:** This parameter is required. If the API request doesn't contain this parameter, it will be detected as a violation. **False:** This parameter is optional.

Schema	Enter the data structure of this parameter. For example:
	`{`
	`"type": "string",`
	`"maxLength": 5,`
	`"minLength": 1`
	`}`
	For more information, refer to Supported parameter and body structure.

7. Click the **body** tab under **Request** section. Check the request body learned by the machine learning model. You can click **Edit** icon to modify them. For more information, refer to Supported parameter and body structure.
8. Under **Response** section, check the response body to be sent to the client. You can click the **Edit** icon to modify them. For more information, refer to Supported parameter and body structure.
9. Click **OK**.

Supported parameter and body structure

The parameters and the body schema should follow the API 2.0 specification. Refer to : https://swagger.io/specification/

FortiAppSec Cloud supports the following types in parameter:

- boolean
- number
- string
- object (one level)

FortiAppSec Cloud supports the following types in body:

- boolean
- number
- string
- array
- object

For the "string" type in parameter and body, the following formats are supported:

- data-time (rfc3339)
- date (rfc3339)
- time (rfc3339)
- email (rfc5322)
- hostname (rfc1034)
- ipv4 (rfc2673)
- ipv6 (rfc2373)

Examples:

```
{

“type”: “string”,

"maxLength": 5,

"minLength": 1,

"pattern": "^(\\([0-9]{3}\\))?[0-9]{3}-[0-9]{4}$"
}



{
“type”: “string”,
“format” : “email”
}
```

Please note the "format" and "pattern" can be learned by the Schema Protection model, but you can manually add it for the system to validate the API requests against.

```
{
“type”: “number”,
"minimum": 0,
"maximum": 100
}

{
“type”: “array”,
"items": {
"type": "number"
}
"minItems": 2,
"maxItems": 3
}

{
“type”: “object”,
"properties": {
"number": { "type": "number" },
"street_name": { "type": "string" }
},
"required": [" number "]
}
```

Combined types in schema are supported. For example:

```
{
"oneOf": [
{ "type": "number"},

{ "type": "string" }

]

}
```

OpenAPI Validation

The OpenAPI Specification (OAS) defines a standard, language-agnostic interface to RESTful APIs, which allows both humans and computers to discover and understand the capabilities of the service without access to source code, documentation, or through network traffic inspection.

If your API interfaces are implemented using OpenAPI, you can configure an OpenAPI Validation rule, and import a validation file which defines the data structure of the OpenAPI request, such as the request URL, the parameter names in the URL, the value of the parameters (string, integer, etc.), where are parameters submitted (URL, header, body, etc.), and so on.

The validation file specifies the scope for FortiAppSec Cloud to scan against. For example, if request URLs are defined in the validation file, FortiAppSec Cloud applies OpenAPI Validation rule only to the requests whose URLs match with the ones defined in the validation file, and take actions if they violate the data structure. For those requests whose URLs are not defined in the validation file, FortiAppSec Cloud will skip the OpenAPI Validation rule and pass the requests to be scanned against other rules. For use cases, see "OpenAPI Validation" in FortiWeb Administration Guide.

FortiAppSec Cloud only supports OpenAPI 3.0.

The figure below shows how FortiAppSec Cloud supports OpenAPI.

To configure an OpenAPI Validation rule

1. Go to **API PROTECTION > OpenAPI Validation**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Click **+ Create OpenAPI Validation Rule**.
3. In **Edit OpenAPI Validation Rule** dialog, click **Choose File** to upload a valid OpenAPI file. Make sure the OpenAPI file doesn't contain any structural error, otherwise the OpenAPI Validation Rule will not take effect.

   It is RECOMMENDED you use **Swagger Editor** to generate your OpenAPI file, https://swagger.io/tools/swagger-editor/.
4. Click **OK**.

   The file title, description, server URL information will be listed in the table if any automatically. You can also click to edit, delete the file, or view the file details.

   You can continue creating at most 10 OpenAPI Validation rules for an application.
5. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.
   To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings >**

Settings.

Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).

6. Click **SAVE**.

JSON Protection

JSON is a lightweight data-interchange format, and attackers may try to exploit sensitive information in JSON code to attack web servers.

If your API interfaces are implemented using JSON API, you can configure JSON protection rules to define and enforce acceptable JSON content.

To create a JSON protection rule

1. Go to **API Protection > JSON PROTECTION**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Click **+Create JSON Protection Rule**.
3. Configure these settings.

Name	Enter a name for the JSON protection rule.
Request URL	Type the URL used to match requests, such as `/upload.php`, or use wildcards to match multiple URLs, such as `/folder1/*` or `/folder1/*/index.htm`. The URL must begin with a slash (/). **Notes:** For those requests whose URLs don't match with the **Request URL**, FortiAppSec Cloud will not apply JSON Validation rule on them.
JSON Limits	Enable to use the following default limits for data size, key, and value, etc. • Key size: 512 Bytes • Key number: 1024 • Value size: 10240 Bytes • Value number: 1024 • Value number in array: 1024 • Object depth: 1028
Schema Validation	Enable to import JSON schema files to check JSON contents in HTTP requests. The JSON schema file defines JSON data structure and the valid JSON data contents. Make sure the schema file doesn't contain any structural error, otherwise the JSON Protection Rule will not take effect.
Schema File	Upload an acceptable JSON schema file. Available only when Schema Validation is enabled.

4. Click **OK**.
5. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.
   To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings >**

Settings.

Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).

6. Click **SAVE**.

XML Protection

XML is commonly used for data exchange, and hackers sometimes try to exploit security holes in XML code to attack web servers. XML Protection examines client requests for anomalies in XML code, and also attempts to validate the structure of XML code in client requests using trusted XML schema files.

If your API interfaces are implemented using XML, you can configure XML protection rules to ensure that the content of XML API requests does not contain any potential attacks.

To create an XML protection rule

1. Go to **API PROTECTION > XML Protection**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Click **+Create XML Protection Rule**.
3. Configure these settings.

Name	Enter a name for the XML protection rule.
Request URL	Type the URL used to match requests, such as `/upload.php`, or use wildcards to match multiple URLs, such as `/folder1/*` or `/folder1/*/index.htm`. The URL must begin with a slash (/). **Notes:** For those requests whose URLs don't match with the **Request URL**, FortiAppSec Cloud will not apply XML Validation rule on them.
XML Limits	Enable to define limits for attributes, CDATA, and elements.
Schema Validation	Enable to import XML schema files to check XML contents in HTTP requests. XML schema files specify the acceptable structure of and elements in an XML document. Make sure the schema file doesn't contain any structural error, otherwise the XML Protection Rule will not take effect.
Schema File	Upload an acceptable XML schema file. Available only when Schema Validation is enabled.
Forbid XML Entities	Enable to configure limits for the XML entities.

4. Click **OK**.
5. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.
   To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).

6. Click **SAVE**.

Mobile API Protection

When a client accesses a web server from a mobile application, the Mobile API Protection module checks whether the request carries the JWT-token header and whether the token carried is valid for the following three cases:

- The request doesn't carry the JWT-token header;
- The request carries the JWT-token header and the token is valid;
- The request carries the JWT-token header and the token is invalid.

Based on the token and request URL, FortiAppSec Cloud takes related actions to avoid potential attacks.

1. Go to **API Protection > Mobile API Protection**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Configure these settings.

Token Secret	Enter the JWT-token secret that you get from the Approov platform. Refer to Approov doc for how to get the token.
Token Header	Indicate the header that carries the JWT-token in the request.
Request URL	Type the URL used to match requests, such as `/upload.php`, or use wildcards to match multiple URLs, such as `/folder1/*` or `/folder1/*/index.htm`. The URL must begin with a slash (/).

3. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.
   To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).

4. Click **SAVE**.

API Gateway

API Gateway allows to manage API users, verify API keys, control API access and rate limits, as well as rewrite API calls.

Creating API users

You can define API users to restrict access to APIs based on API keys.

1. Go to **API PROTECTION > API Gateway**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Click **+Create API User**.
3. Configure these settings.

Name	Enter a name that identifies the user.
Email	Type the email address of the user that is used for contact purpose.
Comments	Optionally, enter a description or comments for the user.
Restrict Access IPs	Restrict this API key so that it may only be used from the specified IP addresses. Both single IP addresses or IP ranges are supported. You can enter multiple IP addresses by clicking .
Restrict HTTP Referers	Restrict this API key so that it may only be used when the specified URLs are present in the Referer HTTP header. This can be used to prevent an API key from being reused on other client-side web applications that don't match this URL (but note that this does not prevent server-side reuse where the referer could be forged). Now only full URL such as `https://example.com/foo` is supported. You can enter multiple referers by clicking .

4. Click **OK**.
   You can continue creating multiple API users.

Once the API user is created successfully, an API key and UUID are automatically assigned to this user by FortiAppSec Cloud. The API key and UUID can not be changed, while you can append IP or HTTP referer restrictions for this user.

Configuring API gateway rules

To restrict API access, you can configure certain rules involving API key verification, API key carryover, sub-URL setting.

1. Click **+Create API Gateway Rule**.
2. For **Name**, type a name for the API gateway rule.
3. For **Match URL Prefixes**, configure the URL prefixes to be routed to the backend.
   - Enter the Frontend Prefix; the frontend prefix is the URL path in a client call, for example, `/good/`, the URL is like this `https://172.22.14.244/good/example.json?param=value`.
   - Enter the Backend Prefix; the backend prefix is the path which the client request will be replaced with, for example, `/api/v1.0/System/Status/`.
     After the URL rewriting, the URL is like this:
     `https://10.200.3.183:90/api/v1.0/System/Status/example.json?param=value`.

   You can enter multiple URL prefixes, which means multiple URL paths may match the API gateway rule.

4. For **Request Settings**, configure these settings:

API Key Verification	When an user makes an API request, the API key will be included in HTTP header or parameter, FortiAppSec Cloud obtains the API key from the request. When this option is enabled, FortiAppSec Cloud verifies the key to check whether the key belongs to an valid API user.
API Key In	Indicate where FortiAppSec Cloud can find your API key in HTTP request: • HTTP Parameter • HTTP Header Available only when API Key Verification is enabled.
Parameter Name	Enter the parameter name in which FortiAppSec Cloud can find the API key when API Key In is HTTP Parameter. Available only when API Key Verification is enabled.
Header Field Name	Enter the header filed name in which FortiAppSec Cloud can find the API key when API Key In is HTTP Header. Available only when API Key Verification is enabled.
Allow Users	Select API users created to define which users have the persmission to access the API. Available only when API Key Verification is enabled.
Rate Limit	Type the number of API call requests in certain time period.
Requests in	Type the time period during which the API call requests are made.

5. Click **OK**.

Configuring actions

1. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner.
   To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).
Period Block	Block the current request. Moreover, all the subsequent requests from the same client in the next 10 minutes will also be blocked.

2. Click **SAVE**.

Account Takeover

Account takeover feature allows you to detect and protect against account takeover threats. FortiAppSec Cloud tracks the authentication URL to your website and identifies all user access. Attack logs will reference the username and additional protection capabilities such as Credential Stuffing Protection and Session Fixation Protection.

FortiAppSec Cloud uses a user tracking rule to track users. When FortiAppSec Cloud detects users that match the criteria you specify in the user tracking rule, it stores the session ID and username.

FortiAppSec Cloud tracks only users who have logged in successfully. It uses one of the following methods to determine whether a log in is successful:

- The response matches a condition you specify in the user tracking rule, such as a return code, a specific redirect URL or a string in the response body. You create these conditions in Authentication Successful Condition on page 142.
- If the response does not match a condition in Authentication Successful Condition on page 142, FortiAppSec Cloud uses the default results `failed`.

FortiAppSec Cloud stops tracking users when either of the following two events occur:

- The client request contains the log off URL that you specify in the user tracking rule. (The log off URL setting is optional.)
- The session is idle for longer than the session timeout value `14400 seconds`.

To configure a user tracking rule

1. Go to **Account Takeover**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Configure these settings.

Authentication URL	Enter the URL to match in authorization requests. Ensure that the value begins with a forward slash (/).
Log Off URL	Optionally, enter the URL of the request that a client sends to log out of the application. When the client sends this URL, FortiAppSec Cloud stops tracking the user session. Ensure that the value begins with a forward slash (/).
Username Field	Enter the username field value to match in authorization requests.
Password Field	Enter the password field value to match in authorization requests.
Session ID Name	Type the name of the session ID that is used to identify each session. Examples of session ID names are `sid, PHPSESSID`, and `JSESSIONID`.
Authentication Successful Condition	
Return Code	Enter the value of the return code when the authentication is successful. It should be a regular expression.
Redirect URL	Enter the redirect URL when the authentication is successful. It should be a regular expression.

Response Body	The response body when the authentication is successful. It should be a regular expression.
Credential Stuffing Protection	Enable to use FortiGuard's Credential Stuffing Defense database to prevent against Credential Stuffing attacks. When this setting is enabled, FortiAppSec Cloud will evaluate the username (Username Field) and password (Password Field) of the matched login requests against the Credential Stuffing Defense database to identify whether the paired username/password has been spilled. The **Test** button allows you to verify the functionality of the Credential Stuffing database. When clicked, it opens a modal window where you can input a username and password that might be compromised. The system will then indicate whether these credentials have been leaked.
Session Fixation Protection	Enable to configure FortiAppSec Cloud to erase session IDs from the cookie and argument fields of a matching login request. FortiAppSec Cloud erases the IDs for non-authenticated sessions only. For web applications that do not renew the session cookie when a user logs in, it is possible for an attacker to trick a user into authenticating with a session ID that the attacker acquired earlier. This feature prevents the attacker from accessing the web app in an authenticated session. When this feature removes session IDs, FortiAppSec Cloud does not generate a log message because it is very common for a legitimate user to access a web application using an existing cookie. For example, a client who leaves his or her web browser open between sessions presents the cookie from an earlier session.

3. Select the action that FortiAppSec Cloud takes when it detects a violation of the rule from the top right corner. To configure the actions, you must first enable the **Advanced Configuration** in **WAF > System Settings > Settings**.

Alert	Accept the request and generate an alert email and/or log message.
Alert & Deny	Block the request (or reset the connection) and generate an alert email and/or log message.
Deny(no log)	Block the request (or reset the connection).

4. Click **SAVE**.

Application Delivery

You can configure FortiAppSec Cloud to rewrite URLs and headers to prevent the disclosure of underlying technology or website structures to HTTP clients; the Caching and Compression feature can help you improve performance of your back-end network and servers by reducing their traffic and processing load.

- Rewriting Requests
- Caching and Compression
- Waiting Room

Rewriting Requests

Rewriting URLs and headers allows changing the structure of the request from clients before forwarding them to the web application.

Some web applications need to know the IP address of the client where the request originated in order to log or analyze it. Thus, you need to enable FortiAppSec Cloud to add or append to an `X-Forwarded-For:` or `X-Real-IP:` header. The web server can instead use this HTTP-layer header to find the public source IP and path of the IP-layer session from the original client.

To configure **Rewriting Requests**, you must have already enabled this module in **Add Modules**. See Add and Remove Modules.

Add X-Forwarded-For	Enable to include the `X-Forwarded-For:` HTTP header in requests forwarded to your web servers. If the HTTP client or web proxy does not provide the header, FortiAppSec Cloud adds it, using the source IP address of the connection. If the HTTP client or web proxy already provides the header, it appends the source IP address to the header's list of IP addresses. This option can be useful if your web servers log or analyze clients’ public IP addresses, if they support the `X-Forwarded-For:` header. If they do not, disable this option to improve performance.
Add Source Port	If enabled, the `X-Forwarded-For:` header will record the connection's source port as well as the source IP.
Add X-Forwarded-Port	If enabled, an `X-Forwarded-Port:` header will be added to record the connection's original destination port.
Add X-Real-IP	Enable to include the `X-Real-IP:` HTTP header on requests forwarded to your web servers. Behavior varies by the header already provided by the HTTP client or web proxy, if any, see Add X-Forwarded-For. Like `X-Forwarded-For:`, this header is also used by some proxies and web servers to trace the path, log, or analyze based upon the packet’s original source IP address.
Use X-Header to Identify Original Client's IP	If you have a front-end load balancer or proxy, enable this option to derive the original clients’ IP from the X-Header, rather than from the connection's source IP. FortiAppSec Cloud will detect violations and report logs based on the IP derived from X-Header.

To configure a rewriting rule

1. Go to **Application Delivery > Rewriting Requests**.
2. Click **Add Rule**.
3. Configure these settings.

Name	Type a name that can be referenced by other parts of the configuration.
Action	Select the item that this rule will rewrite HTTP requests from clients. • Rewrite Host Rewrite the `Host:` field in the header of an HTTP request.

	• Rewrite URL Rewrite the URL line in the header of an HTTP request. • Rewrite Referer Rewrite the `Referer:` field in the header of an HTTP request. • Insert Header In Header Name and Header Value, insert the name of the header field that you want to insert to a request, and the value of the header field accordingly. • Redirect URL (301 Permanently) Type a URL, such as /catalog/item1, to which a client will be redirected to. It is used in the `301 Moved Permanently` response. • Redirect Host (301 Permanently) Type either a host name or IP address (e.g. http://store.example.com or https://2.2.2.2), to which a client will be redirected. It is used in the `301 Moved Permanently` response. **Note:** Only literal form is supported for the **Rewrite/Redirect To** field, but regular expression is supported for the **Rewrite/Redirect From** field. For example, the following configuration can redirect "a.com" to "www.a.com": • **Redirect From:** ^a\.com$ • **Redirect To:** https://www.a.com To achieve the opposite effect, you can use the following configuration to redirect from "www.a.com" to "a.com", excluding the "www": • **Redirect From:** ^www\.a\.com$ • **Redirect To:** https://a.com For both examples above, the Action would be set to "Rewrite Host".
Action: Rewrite HTTP Header Advanced	This action enables FortiAppSec Cloud to rewrite HTTP header when multiple conditions are met. **Rewriting Condition:** Specify one or more conditions that the HTTP request must match. The conditions are in an "AND" relationship. • Match Host: Enter the value of the `Host:` field to match. • Match URL: Enter the URL to match. • Match Referer: Enter the value of `Referer:` field to match. • Protocol Filter: Select the protocol if you want to restrict the condition only for either HTTP or HTTPS. **Rewriting Behavior:** Replace the corresponding elements in HTTP request with the values specified below. Multiple behaviors will be applied as specified. • Rewrite Host: Enter the `Host:` value to replace with. • Rewrite URL: Enter the URL to replace with. • Rewrite Referer: Enter the value of `Referer:` field to replace with. • Insert Header: Enter the header name and value to insert into the HTTP request. • Remove Header: Remove the header from HTTP request.

Action: Redirect Advanced (301 Permanently)	This action enables FortiAppSec Cloud to redirect HTTP request when multiple conditions are met. **Rewriting Condition:** Specify one or more conditions that the HTTP request must match. The conditions are in an "AND" relationship. • Match Host: Enter the value of the `Host:` field to match. • Match URL: Enter the URL to match. • Match Referer: Enter the value of `Referer:` field to match. • Protocol Filter: Select the protocol if you want to restrict the condition only for either HTTP or HTTPS. **Rewriting Behavior:** Redirect the request to the specified location when the above conditions are met. • Rewrite Location: The location can be a URL, a host name, or an IP address.
URL Translation	Enable it to keep the URL path while redirecting clients to a new host or IP address in a “301 Permanently” response. For example, clients visiting "www.aaa.com/test.html" can be redirected to "www.bbb.com/test.html". Available only if the action is **Redirect Host (301 Permanently)**.
Protocol Filter	Enable if you want to match this condition only for either HTTP or HTTPS. For example, you could redirect clients that accidentally request the login page by HTTP to a more secure HTTPS channel—but the redirect is not necessary for HTTPS requests. As another example, if URLs in HTTPS requests should be exempt from rewriting, you could configure the rewriting rule to apply only to HTTP requests.
Protocol	Select which protocol will match this condition, either **HTTP** or **HTTPS**. This option appears only if **Protocol Filter** is enabled.

4. Click **OK**.
You can continue creating at most 12 rewriting rules for an application. Please be aware that the rules operate under "OR" conditions. This implies that FortiAppSec Cloud will process the request based on the first matching rule, subsequently forwarding the request to the next scan.

Caching and Compression

To improve performance of your back-end network and servers by reducing their traffic and processing load, you can configure FortiAppSec Cloud to cache and compress responses from your servers.

To configure **Caching and Compression**, you must have already enabled this module in **Add Modules**. See Add and Remove Modules.

When enabling caching make sure you correctly configured the web server’s no-cache/no-store directives to avoid caching sensitive data.

1. Configure these settings.

Default Cache Timeout	Type the time to live for each entry in the cache. Expired entries will be removed. A subsequent request for the URL will cause FortiAppSec Cloud to forward the request to the server in order to cache the response again. Any additional requests will receive FortiAppSec Cloud’s cached response until the URL’s cache timeout occurs.
Allow HTTP Method	Select whether to cache the response contents according to the HTTP method you use. • GET, HEAD (Recommended) • GET, HEAD, OPTIONS • GET, HEAD, OPTIONS, PUT, POST, PATCH, DELETE
Allow Return Code	Select whether to cache the response contents according to the response code. • 200 (Recommended) • 200, 206 • 200, 206, 301, 302
Allow File Type	Select whether to cache the response contents according to the content type. • Text • Picture • Media • Binary • Other
Key Generation Factor	Select the protocol variable that you want to use to generate the cache key. • Method, such as GET, POST, HEAD, etc. • Protocol, the string can be either “http://” or “https://”; • Host • URL • Arguments, for example in request `http://host.com/test.php?a=1&b=2` , the Arguments string is “`a=1&b=2`”. • Cookies—Once you have created a web cache rule, you can edit the rule to indicate cookies in HTTP requests and append them to the key string to generate the cache key.

2. Click **Create New** to configure the URLs not to be cached.
3. Configure these settings.

HTTP Method	Select the HTTP method in which the request URL is included.
URL Expression	Enter a regular expression, such as `^/*.php`, matching the sub URLs to which the rule should apply. The pattern does not require a slash (`/`), but it must match sub URLs that begin with a slash, such as `/index.cfm`. For details, see "Regular expression syntax" on page 1.

Bypass Arguments	Enable this option and enter the argument name so that the request matches the bypass URL only when the request brings the specific arguments.
Bypass Cookies	Enable this option and enter the cookie name so that the request matches the bypass URL only when the request brings the specific cookies.

4. Click **OK**. You can continue creating multiple Bypass Sub URL lists.
5. Enable **Compression** to completely offload compression to FortiAppSec Cloud to save resources on your web servers.
6. Select the content types that you want to compress. Click **Change**, select the content type, and then click the right arrow (**->**) to move them to the **Allow Content Types** list.
7. Click **SAVE**.

You can click the **Clear Cache** button at the top right corner of the page to clear the responses cached on FortiAppSec Cloud.

What can be cached?

Caching generally works best with data that doesn't change. Things like static web pages, images, movies, and music all typically work well.

When content changes often, caching provides overhead by consuming RAM without its usual benefit of reduced latency. Some HTTP headers and other factors indicate dynamic content which FortiAppSec Cloud will not cache.

FortiAppSec Cloud will not cache responses if the request:

- Has fields such as `Cache-Control: no-cache/no-store/`; `Pragma:no-cache`
- Contains the header:
  - `Authorization`
  - `Proxy-Authorization`

FortiAppSec Cloud will not cache if the response:

- Has a Set-Cookie: field
- Has a Vary: field
- Has fields such as `Cache-Control: no-cache/no-store/private; Pragma:no-cache; Cache-Control: max-age=0`
- Contains the header:
  - `Proxy-Authorization`
  - `Connection`
  - `Keep-Alive`
  - `Proxy-Authenticate`
  - `TE`
  - `Trailers`
  - `Transfer-Encoding`
  - `Upgrade`

Waiting Room

To manage visitor traffic and avoid server overload delays, you can enable a virtual holding space and queuing system, allowing new users to enter a Waiting Room where they can view estimated wait times before accessing your application.

This feature may be configured for your entire website, or specific URL paths.

Before you configure Waiting Room, you must have already enabled this module in **Add Modules**. See How to add or remove a module.

Overview

Waiting room's **Overview** tab highlights key traffic insights for your application.

Total Active Users	The total number of users accessing your application.
New Users	The number of users joining your application at one time.
Total Waiting Users	The number of users currently in the Waiting Room.
Estimated Waiting Time	The length of time a new user is expected to wait before accessing your application.

You have the option to configure the time period for each graph of the above values, allowing you to select from the last hour, the last 24 hours, or the last 7 days.

Use the displayed information to make adjustments and optimize your configured settings for the Waiting Room feature.

Settings

To configure Waiting Room Settings:

1. Go to **Application Delivery > Waiting Room > Settings** and toggle the switch ON.
2. Configure these settings:

   Please note, you are required to configure at least one of **Total Active Users** and **New Users Per Minute**. In addition, **Path** and **Maximum Idle Time** cannot be empty.

Total Active Users	Control the size of traffic accessing your application. When enabled, if the number of active users reaches the configured value, additional users will enter the Waiting Room.
New Users per Minute	Prevent your application from being flooded by new users in a short time span. When enabled, if the number of new users per minute reaches the configured value, additional users will enter the Waiting Room.
Path	The waiting room will only be enabled for the configured URL. Use /.* to match all. Path can be an exact string, wildcard, or regular expression. It is also case sensitive. This value cannot be empty.
Maximum Idle Time	Users who have remained idle for the configured time will be considered as a new user. Users who have ended and restarted the session will also be considered as a new user.

	This value cannot be empty.
Bypass Rules	Allow users with certain IP addresses to access your application directly, even if they trigger the above limiting conditions. Click **Create New** and enter an IP address or range in the **Value** field to configure a new Bypass rule.

3. Click **SAVE**.

Global Trustlist

You can configure FortiAppSec Cloud to ignore scanning parameters specified for modules of signature based detection, syntax based detection, and anomaly detection across the entire application.

1. Go to **SECURITY RULES > Global Trustlist**.
   You must have already enabled this module in **Add Modules**. See Add and Remove Modules.
2. Click **Create New**.
3. Configure these settings.

Parameter Name	Enter a unique name for the parameter as it appears in the URL or HTTP body.
Request Status	Optionally, you can enable to indicate a regular expression designed to match multiple URLs, which carry the trustlist parameters.
Request URL	Specify a URL value to match, such as `^/*.php`, which matches requests for `http://www.test.com/^/*.php`. The pattern does not require a slash (/); however, it must at match URLs that begin with a slash, such as `/index.cfm`. See Frequently used regular expressions on page 177. Do not include a domain name because it's by default the domain name of this application.

4. Click **OK**.

   In the global trustlist table, you can click buttons ✎ ✖ 🗑 to edit, or delete the parameter rule; also, you can choose to enable or disable to indicate the URL to match.

Vulnerability Scan

The Vulnerability Scan module integrates FortiDAST's web vulnerability scanner (WVS) to help identify OWASP Top 10 vulnerabilities in web applications and provides a detailed report with remediation recommendations to enhance security.

By default, the Vulnerability Scan report reflects your current WAF configuration, highlighting vulnerabilities that remain exposed to attackers. This helps you fine-tune WAF settings to improve security.

If you want to see vulnerabilities assuming WAF protection is disabled, enable the Bypass WAF option at the top-right corner of the **Vulnerability Scan** page.

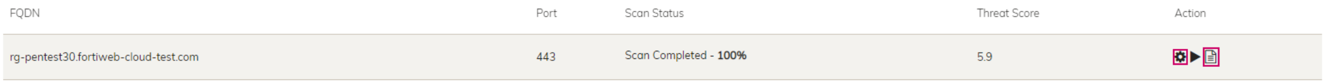
To add applications for vulnerability Scan:

1. Navigate to **Vulnerability Scan**.
2. Click **Create New**.
3. In **Add Asset** window, select the **FQDN** and **Port**. These are the domain names and port numbers you have defined in **Network > Endpoints**.
4. Click **OK**.

The maximum number of applications allowed are defined in your contracts. Check your contract information in **General > Contracts** .

To configure and view the vulnerability report:

Click the **Settings** button to configure scanning settings and the **Reports** button to view the reports. For more information, check FortiDAST User Guide: https://docs.fortinet.com/product/FortiDAST



FQDN	Port	Scan Status	Threat Score	Action
rg-pentest30.fortiweb-cloud-test.com	443	Scan Completed - **100%**	5.9	⚙ ▶ 🗎

To configure your Vulnerability Scan subscription from a public cloud marketplace:

Go to **WAF > System settings > Contracts**.

Billing

The billing cycle for Vulnerability Scan occurs monthly, and you will be charged on the date you initially add an application and subsequently on the same date each month. For instance, if you add an application on May 1st, your next billing date will be June 1st. If you happen to remove the application on May 15th and then re-add it on May 20th, you will be charged once at the time of re-adding the application. Following this, your next billing date will be on June 20th.

Please note that Vulnerability Scan seats are nontransferable. Removing applications does not open a seat in your contract that can be replaced with a different application.

DevOps tools

FortiAppSec Cloud's WAF service supports DevOps tools to provide more ways to efficiently deploy, manage, and automate application security.

You can use DevOps tools to automatically onboard or delete applications from FortiAppSec Cloud. You can also change the IP list in IP Protection using Ansible.

- Configuring WAF with Terraform on page 179
- Configuring FortiAppSec Cloud with Ansible
- Configure WAF with Jenkins on page 152

Configuring WAF with Terraform

Terraform is a DevOps tool that integrates with FortiAppSec Cloud using the FortiAppSec Cloud Terraform Provider, which automates the provisioning and management of FortiAppSec Cloud WAF resources.

Prerequisites for using Terraform with WAF

- FortiAppSec Cloud API access.
- FortiAppSec Cloud Provider version 1.0.0 or later.
- Terraform version 0.13 or later.
- Terraform template for setting up WAF
  - Download the template by following the instructions under **Installation** on the Github repository.
  - Obtain a template from the support team or your sales engineer.

Configuration Instructions

For setup instructions on using FortiAppSec Cloud WAF with Terraform, please refer to the following external resources:

- **Creating new applications:** with Terraform, please see the README section of our GitHub repository, referring to Terraform documentation for Argument References covering OpenAPI validation and application creation use cases.
- **Migrating pre-existing Terraform integration settings from FortiWeb Cloud:** please refer to the instructions under Migrate FortiWebCloud private provider to FortiAppSecCloud.

State File Backup: Before modifying the state file, ensure it is backed up to prevent data loss.

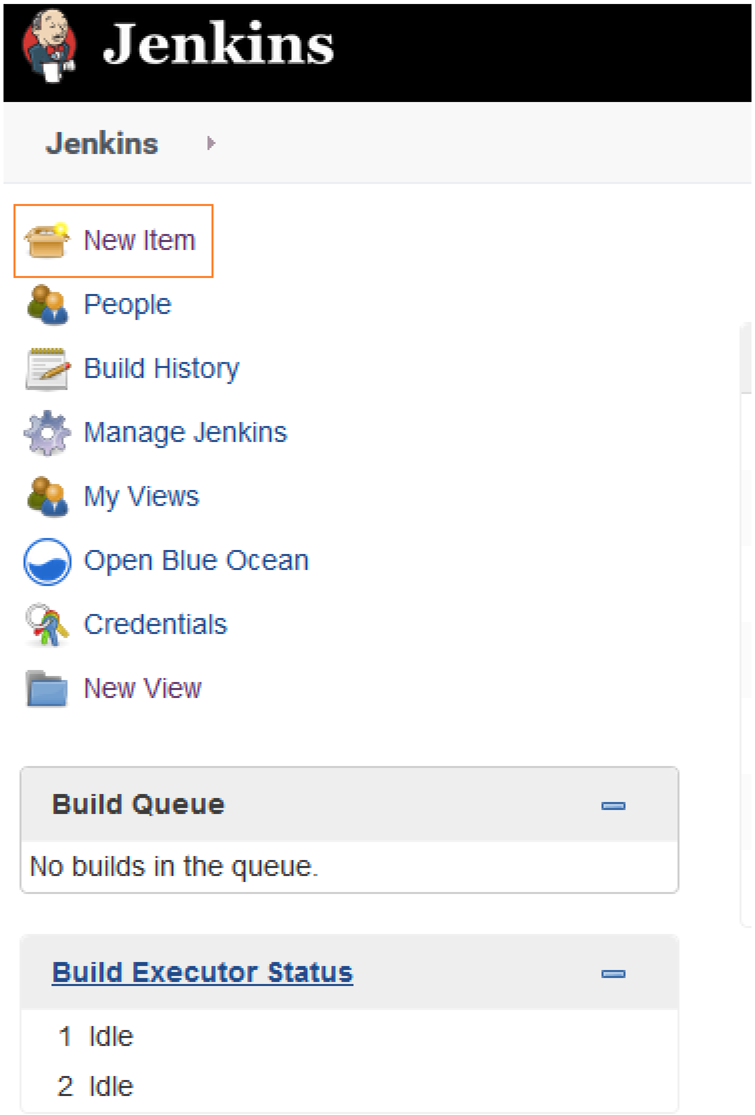
Configure WAF with Jenkins

The following example demonstrates how to use Jenkins to perform simple configuration changes on FortiAppSec Cloud. It requires the following:

- Pipeline Template for integrating WAF with Jenkins, please su
- Jenkins: This example uses Jenkins 2.222.3+.

To onboard an application with Jenkins, follow the steps below:

1. Log in to your Jenkins account.
2. Click **New Item**.



3. Name the item and select **Pipeline**, then click **OK**.
4. Select **This project is parameterized**.

5. In **String Parameter**, enter **user** in **Name**, then enter your FortiAppSec Cloud's account name in **Default Value**. The account should have write privilege on FortiAppSec Cloud.

6. In **Password Parameter**, enter **password** in **Name**, then enter the password of the specified account in **Default Value**.

7. In **String Parameter**, enter **application_name** in **Name**, then enter a name for your application. It will be displayed on FortiAppSec Cloud's GUI to identify your application.

8. In **String Parameter**, enter **domain_name** in **Name**, then enter your application's domain name in **Default Value**.

9. In **Multi-line String Parameter**, enter **extra_domains** in **Name**, then enter the domain names if your application has multiple domains.

10. In **String Parameter**, enter **origin_server_ip** in **Name**, then enter your origin server's IP address in **Default Value**.

11. In **String Parameter**, enter **HTTP** in **Name**, then enter the port number used for HTTP service in **Default Value**.You must enter 80 as the default value.

12. In **String Parameter**, enter **HTTPS** in **Name**, then enter the port number used for HTTPS service in **Default Value**. You must enter 443 as the default value.

13. In **String Parameter**, enter **origin_server_service** in **Name**, then enter your origin server's service type in **Default Value**. You must input HTTP or HTTPS as the default value.

14. In **String Parameter**, enter **origin_server_port** in **Name**, then enter your origin server's listening port in **Default Value**. You can input 80 for HTTP or 443 for HTTPS as the default value.

15. In **Boolean Parameter**, enter **cdn** in **Name**, then enable this option if you want your application to be accelerated in the global network.

16. In **Boolean Parameter**, enter **block** in **Name**, then enable this option if you want FortiAppSec Cloud to block the attacks and abnormal traffic.
17. In **String Parameter**, enter **template** in **Name**, then enter the name of the template if you want your application to inherit configuration from the template.

18. Specify the repositories in the pipeline. The repository URL is https://github.com/fortinet/fortiwebcloud-jenkins and the script path is "jenkins/CreateApp". Click **Save** to finish the setup.

19. Now you can schedule the build.

20. Review the configuration before running the build. Click **Build**.

21. If nothing is wrong, you will see the successful operation via Console Output.

To delete app via Jenkins, follow the steps below:

1. Click **New Item** to add a new item.
2. Name the item and select **Pipeline**, then click **OK**.
3. Select **This project is parameterized**.
4. In **String Parameter**, enter **user** in **Name**, then enter your FortiAppSec Cloud's account name as its default value.
5. In **Password Parameter**, enter **password** in **Name**, then enter the password of the specified account in **Default Value**.
6. In **String Parameter**, enter **application_name** in **Name**, then enter the name of your application to be deleted.
7. Specify the repositories in the pipeline. The repository URL is https://github.com/fortiweb/FortiwebCloudJenkins and the script path is "jenkins/DelApp". Then click **Save** to finish the setup.
8. Run the build. If nothing is wrong, then the delete process will be output and your application will be deleted from FortiAppSec Cloud.

System Settings

Configure your preferred settings that apply to the overall application.

- Settings on page 354
- Cloud Connectors on page 156
- Custom block pages on page 157

WAF Settings

Origin Server Lock

Lock your origin server's IP address to ensure it can only be used by your account. The Origin Server Lock prevents other accounts on FortiAppSec Cloud from setting up an application targeting malicious traffic at your origin server.

The Origin Server Lock setup is only configurable through Fortinet support. Please contact the support team and provide your origin server's IP addresses. We will do the setup for you.

Fabric Connector

Connect to the Security Fabric with FortiGate version 7.0.0 or newer. For configuration instructions, see Connecting WAF to the Fortinet Security Fabric on page 176.

Consumption Report

This feature is disabled by default. Enabling this feature will result in the automatic generation and delivery of monthly Consumption Reports to the email addresses entered in the **Recipients** box.

Consumption reports encompass usage details for all applications within the user's account, providing data on metrics like throughput and bandwidth. Consumption data for each month is generated on the 5th of the following month. For instance, data for October will be generated on November 5th.

Please refer to the table below on levels of access for different user types:

User Type	Level of Access
Organization root account	Can enable or disable consumption report for itself and all tenants.
Organization user, not root account	Cannot enable nor disable consumption report.
Non-OU user, excluding Tenants	Can enable or disable consumption report for itself.
Tenant	Cannot enable nor disable consumption report.

Cloud Connectors

In some cases your application server's IP address may dynamically change, for example, when it's deployed in auto-scaling mode on public cloud platforms. Instead of manually updating the origin server's IP address in FortiAppSec Cloud, you can configure a Cloud Connector to authorize FortiAppSec Cloud to access your public cloud resources in order to automatically obtain the latest IP addresses.

To create a Cloud Connector:

1. Go to **WAF > System Settings > Cloud Connectors**.
2. Click **Create Connector**.
3. Configure the following settings.

Name	Enter a name for the Cloud Connector.
Status	Turn on or off the Cloud Connector.
Type	Select the public cloud platform where your application server is deployed.

4. Configure the following settings if the type is **AWS**.
An access key on AWS grants programmatic access to your resources. If you have security considerations, it's recommended to create an IAM role specially for FortiAppSec Cloud and grant read-only access. For how to create an access key, see this article.

Region	The region where your application server is deployed.
Access Key ID	The Access Key ID.
Secret Access Key	Secret Access Key.
VPC ID	The ID of the VPC where your application server is deployed.

5. Configure the following settings if the type is **Azure**.
You must create an Azure AD application to generate the Azure client ID and corresponding Azure client secret. This application must be a service principal. Otherwise, the Fabric connector cannot read the inventory. You can

find the complete instructions at Use portal to create an Azure Active Directory application and service principal that can access resources.

Keep the following in mind when you get to the part about making a new application registration:

- The Application type has two options. Choose Web app/API.
- The Sign-on URL has the asterisk commonly associated with a required field, but this is not applicable in this case. Put in any valid URL in the field to complete the form and enable the Create button.

Server Region	The region where your application server is deployed.
Tenant ID	See instructions above for how to find the Tenant ID.
Client ID	See instructions above for how to find the Client ID.
Client Secret	See instructions above for how to find the Client Secret.
Subscription ID	The ID of the subscription where your application server is deployed.
Resource Group	The name of the resource group where your application server is deployed. Make sure that the service principal (app registration) is granted for the network contributor and VM contributor roles for the target resource group.

6. Configure the following settings if the type is **GCP**.
   A service account is a special type of Google account intended to represent a non-human user that needs to authenticate and be authorized to access data in Google APIs. See Understanding service accounts for how to create a service account and authenticate with private key.

Project ID	The ID of the project where your application server is deployed.
Service Account Email	The Service Account Email that FortiAppSec Cloud uses to access your application server.
Private Key	The Private Key to for authentication.
Zone	The zone where your application server is deployed.

7. Click **Test** to verify whether FortiAppSec Cloud can access the resources with the provided information. If the test succeeds, click **OK** to save the settings.

If you want to edit the settings or delete a Cloud Connector, click the Edit or Delete icon in the Cloud Connector row.

After the Cloud Connector is created, you can go to **Network > Origin Servers** to configure the dynamic server settings so that FortiAppSec Cloud can use the specified conditions to find the right VMs in our account and obtain their IP addresses. See Origin Servers on page 68.

Custom block pages

You can customize the following pages that FortiAppSec Cloud displays to your users:

- The error page FortiAppSec Cloud uses to respond to an HTTP request that violates a policy and the configured action is **Deny** or **Period Block**.
- The "Server Unavailable!" page that FortiAppSec Cloud returns to the client when none of the server pool members are available either because their status is **Disable** or **Maintenance** or they have failed the configured health check.
- The Captcha enforcement pages that FortiAppSec Cloud uses to differentiate between real users and automated users, such as bots.

Configuring a custom block page

Follow steps below to configure a custom block page:

1. Go to **WAF > System Settings > Custom Block Pages**.
2. Under the **Messages** tab, click **Create New**.
3. Enter a name for the block page. The maximum length is 30 characters.
4. Enter description for the block page. The maximum length is 512 characters
5. Click the **Edit** icon for the message you want to edit.
6. In the **Edit Message** window, the left side pane displays the source code, and the right side is how the message shows in the browser.
   It's not allowed to change the macros such as `%%SOURCE_IP%%`. See Macros in custom block pages.
7. Click **Save** to save the changes of the message.
8. If you want to edit other messages, click the **Edit** icon in their rows.
9. Click **OK** to save the block page.
10. To apply a block page for an application, select it in the **Custom Block Pages** list in **Application > Network > Endpoints**.

FortiAppSec Cloud supports up to 8 custom block pages (including the predefined page).

Macros in custom block pages

All the macros and parameters in the HTML code can't be removed or edited, while the text that shows in the Web UI is allowed to be modified.

For example, in the following code, the macros (e.g. `%%CAPTCHA_VCODE_STR%%`) and parameters (e.g. `req_data`) can't be removed or edited, but the text "Security check" can be replaced with any text as you desire.

```
<input type="hidden" name="vcode" value="%%CAPTCHA_VCODE_STR%%">
<input type="hidden" name="req_data" value="%%CAPTCHA_REQ_DATA%%">
<h2>
Security check
</h2>
```

Adding images in custom block pages

The default block pages contain predefined images. To use your own images, you need to upload the image file, then insert image macro in the message body.

Uploading image files

1. Go to **WAF > System Settings > Custom Block Pages**.
2. Under the **Images** tab, Click **Create New**.
3. Specify a name for the image file, select its type, and then click **Choose File** to browse to the file and select it. Ensure the image is no larger than 24 KB and that its type matches the value you have selected for **Type**.
4. Click **OK**.

Inserting image file to messages

Use the following format to add an image macro anywhere in a custom block message:

```
%%IMAGE:<image_name>%%
```

where `<image_name>` is the name of the image you have uploaded.

For example, if you want to add the image `test` to the list of images, use `%%IMAGE%%:test%%` to add it to the HTML code.

```
h2.fgd_icon {
   background: url(%%IMAGE:test%%)
   width: 90px;
   height: 92px;
   margin: 48px auto;
}
```

Templates

A template is a predefined set of WAF configurations that can be applied to an application. Assigning a template automatically configures the application with its settings, making it easy to standardize settings across multiple applications.

FortiAppSec Cloud provides the following predefined templates which contain the most commonly used WAF configurations for different scenarios:

- StandardProtection
- SharePoint
- Drupal
- Exchange
- ExtendedProtection
- Wordpress

The WAF configurations in these predefined templates are un-editable. If you want to create an variation of the pre-defined template, click the Clone icon in the predefined template row to create a new template based on it.

To create a template:

1. Go to **WAF > Templates**.
2. Click **Create Template**. Or click the **Clone** icon in the row of an existing template to create a new template which inherits the configurations of the selected template.
3. Enter a name for this template.
4. Select the application(s) to be applied with this template.
   You can skip this step, then go back selecting applications after you have finished configuring WAF settings for this template.
5. Click **OK**. The template will be created.

To configure WAF settings for a template:

1. Go to **WAF > Templates**. Click the name of the template.
2. Configure WAF settings for this template. Click **Add Modules** to display WAF features in the left side menu. See Modules on page 82 for more information on each WAF feature.
3. After all the settings are done, click **SAVE** at the bottom right of the page to save the settings.

If you change the settings in a template, the changes will be applied to all the applications associated with this template.

To apply a template to application(s):

1. Go to **WAF > Templates**.
2. Find the template you want to use, then click the Edit icon ✎ in this row.
3. Select the application(s) to be applied with the template, then click the right arrow to move them to the right column.
4. Click **OK**.

The configurations in the template will overwrite the existing configurations of the selected applications.

If certain configurations in the template do not fit the application, you can select the application in **WAF > Applications**, and disable **Inherit Template** on the specific WAF module page, then edit configurations for the module. The configurations edited in an application apply only to this application.

Use cases

This chapter introduces the special configurations for different use cases.

Using WAF behind a Content Distribution Service

If the traffic to your application server should be first forwarded to a Content Distribution Service, then flows to FortiAppSec Cloud for threat detection, perform the following steps so that the traffic can correctly go through. In this example we assume the Content Distribution Service is AWS CloudFront.

Adding the WAF application on FortiAppSec Cloud

1. When using WAF behind a Content Distribution Service, please take note of the following configurations. For full WAF onboarding instructions, please see Onboarding WAF applications on page 19.
   - Do not enable **CDN**, as a scrubbing center nearest to your application server will automatically be assigned. In this case, enabling the CDN is unnecessary because AWS CloudFront already handles content delivery.
   - Take note of the CNAME provided by FortiAppSec Cloud. You will need this when setting up your CloudFront service.
2. Go to **Network > Endpoints** to configure the **SSL Certificate** settings. For full configuration instructions, refer to Endpoints on page 61.
   - If you use **Automatic Certificate**, make sure to select **DNS Challenge** type, otherwise the SSL certificate cannot be successfully retrieved.
   - Make sure to include a CNAME record for the DNS challenge. You can locate this record in **WAF > Applications > DNS Status**.

   Please note that DNS status may show as "Unknown". This is an expected issue when using CloudFront in front of FortiAppSec Cloud. It does not affect the retrieval of the certificate, so there is no need to be concerned about it.

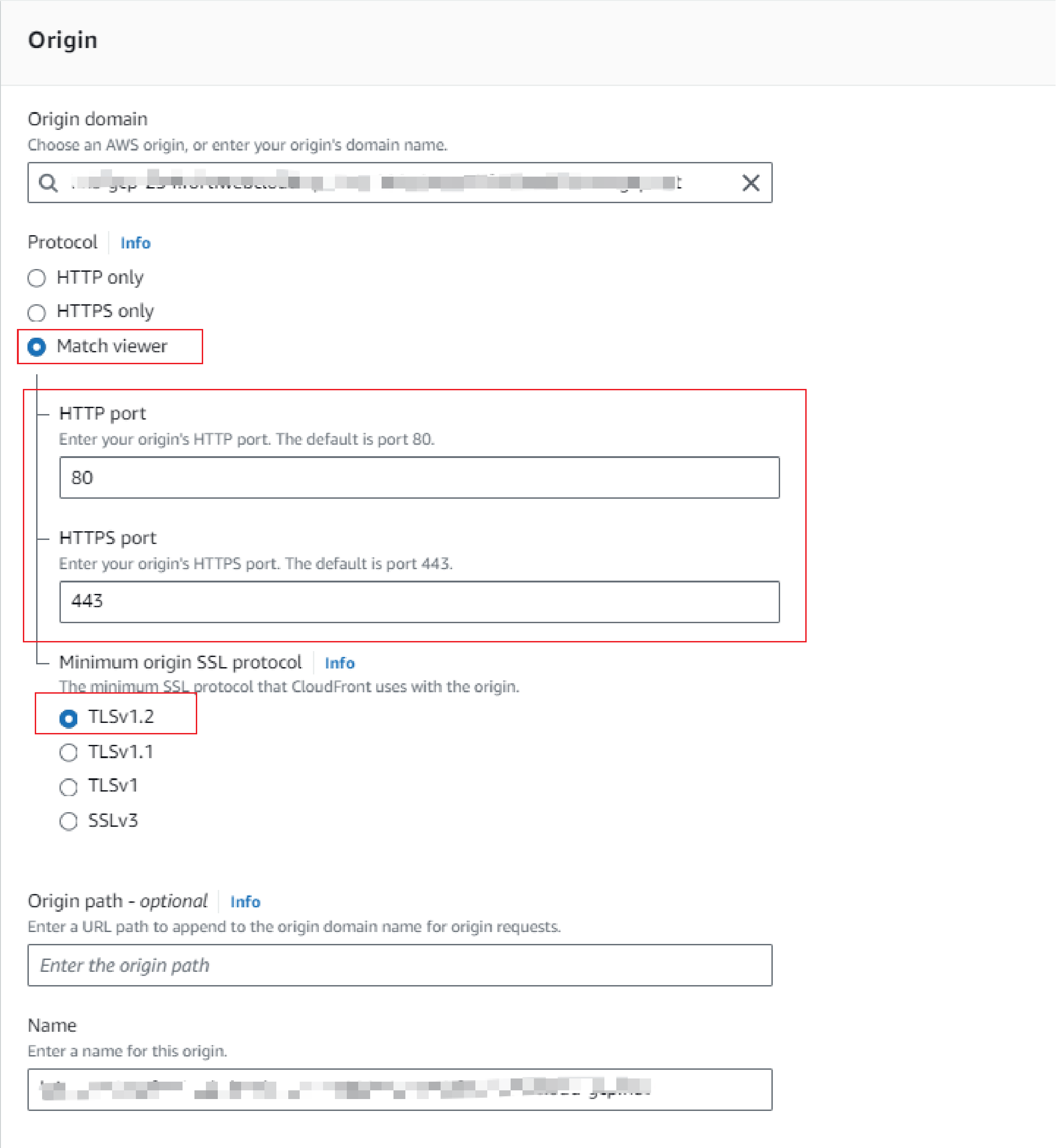
   If you would like to use your own SSL certificate instead of the certificate issued by Let's Encrypt, you can select **Custom Certificate** in **Network > Endpoint** to upload your own SSL certificate.

Creating a Distribution in CloudFront

1. Log in to AWS cloud portal. Navigate to **CloudFront**.
2. Click **Create Distribution**.
3. Configure the following options as described. You can set any option not specified here according to your preference. Refer to AWS online help for more information.

Origin	
Origin Domain	Enter the CNAME provided by FortiAppSec Cloud.

Origin Protocol Policy	Select **Match Viewer** so that the protocol used for the connections between CloudFront and FortiAppSec Cloud WAF can be HTTP or HTTPS. It matches with the protocol used by the viewer, for example, if the viewer connects to CloudFront using HTTPS, CloudFront will connect to FortiAppSec Cloud WAF using HTTPS.
HTTP Port	Set HTTP port value to 80.
HTTPS Port	Set HTTPS port value to 443.
Minimum origin SSL protocol	Select **TLSv1.2**.



Origin

Origin domain

Choose an AWS origin, or enter your origin's domain name.

[redacted]

Protocol | Info

○ HTTP only

○ HTTPS only

● Match viewer

HTTP port

Enter your origin's HTTP port. The default is port 80.

80

HTTPS port

Enter your origin's HTTPS port. The default is port 443.

443

Minimum origin SSL protocol | Info

The minimum SSL protocol that CloudFront uses with the origin.

● TLSv1.2

○ TLSv1.1

○ TLSv1

○ SSLv3

Origin path - *optional* | Info

Enter a URL path to append to the origin domain name for origin requests.

Enter the origin path

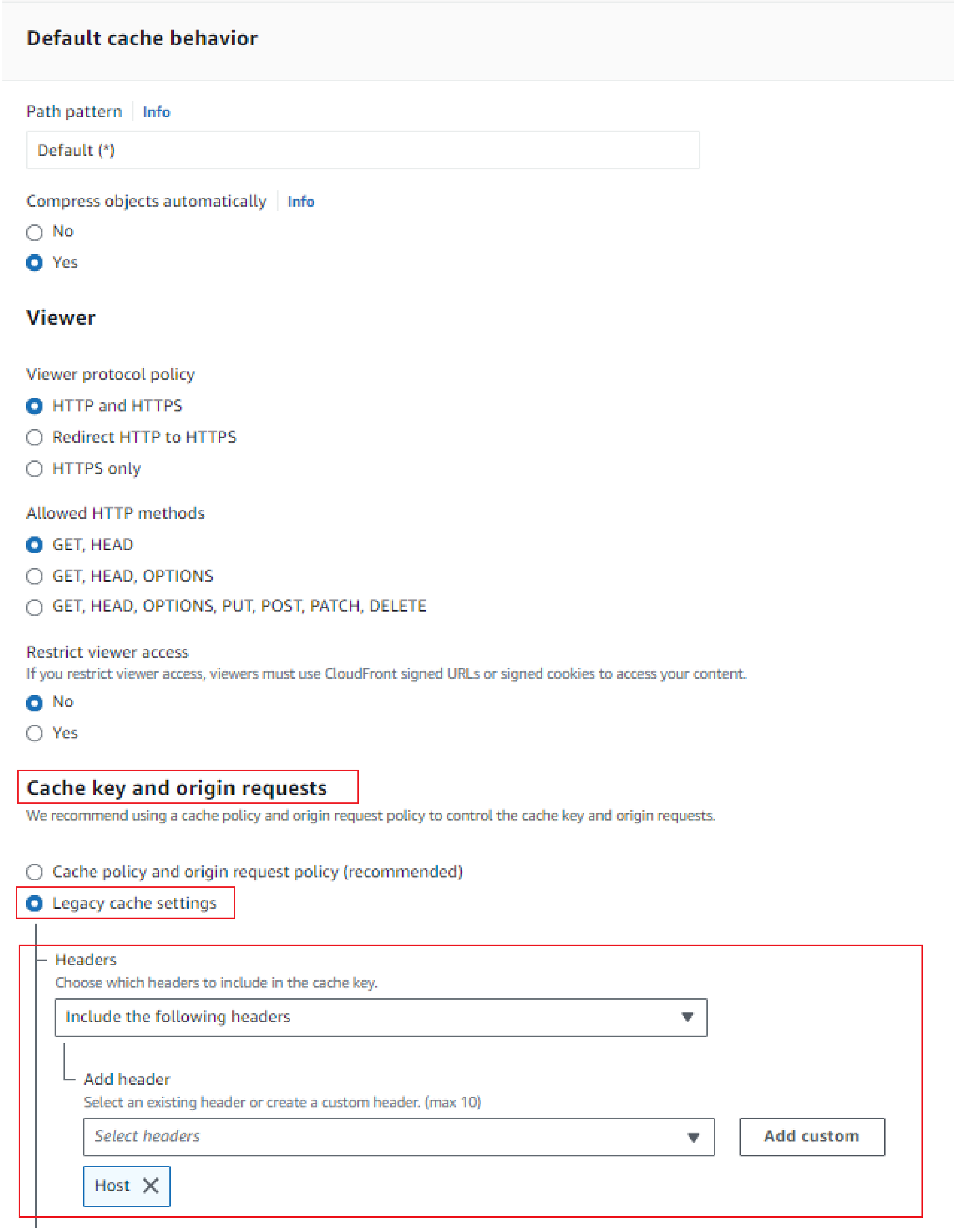
Name

Enter a name for this origin.

[redacted]

Default Cache Behavior

Path Pattern	This field specifies to which requests you want this cache behavior to apply. For example, a path pattern of **images/*.jpg** would apply the cache behavior to .jpg images.
Compress objects automatically	Select "Yes" if you want CloudFront to automatically compress specific file types when viewers support compressed content. This accelerates downloads by reducing file sizes, resulting in faster rendering of web pages for your users.
Viewer Protocol Policy	You can set this option as you want, but, if you select **Redirect HTTP to HTTPS**, it's suggested to turn off **Redirect all HTTP traffic to HTTPS** in **Network > Endpoint** in FortiAppSec Cloud WAF. See Endpoints on page 61.
Allowed HTTP methods	Select the HTTP methods that you want CloudFront to process and forward to your origin
Restrict viewer access	Choose **No** for public URLs or **Yes** for signed URLs when configuring the cache behavior's PathPattern. If selecting **Yes**, specify trusted signers, which are the AWS accounts authorized to create signed URLs.
Cache key and origin requests	Select **Legacy cache settings** from the list, then add header **Host**. CloudFront will directly forward the host header to FortiAppSec Cloud WAF.



Default cache behavior

Path pattern | Info

Default (*)

Compress objects automatically | Info

○ No

● Yes

Viewer

Viewer protocol policy

● HTTP and HTTPS

○ Redirect HTTP to HTTPS

○ HTTPS only

Allowed HTTP methods

● GET, HEAD

○ GET, HEAD, OPTIONS

○ GET, HEAD, OPTIONS, PUT, POST, PATCH, DELETE

Restrict viewer access

If you restrict viewer access, viewers must use CloudFront signed URLs or signed cookies to access your content.

● No

○ Yes

Cache key and origin requests

We recommend using a cache policy and origin request policy to control the cache key and origin requests.

○ Cache policy and origin request policy (recommended)

● Legacy cache settings

Headers

Choose which headers to include in the cache key.

Include the following headers

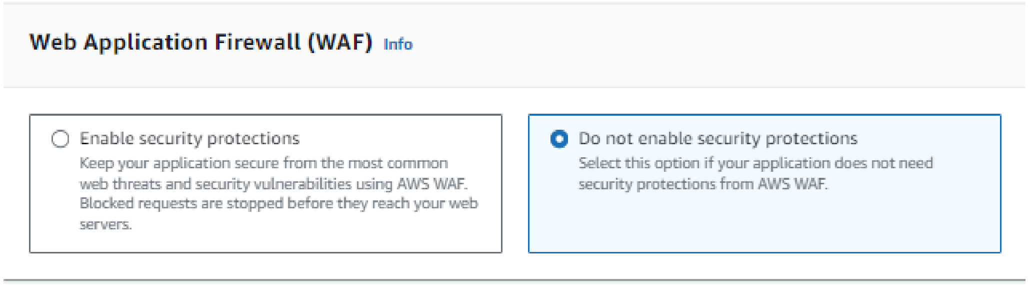
Add header

Select an existing header or create a custom header. (max 10)

Select headers

Host ✕

4. You can choose either WAF option.



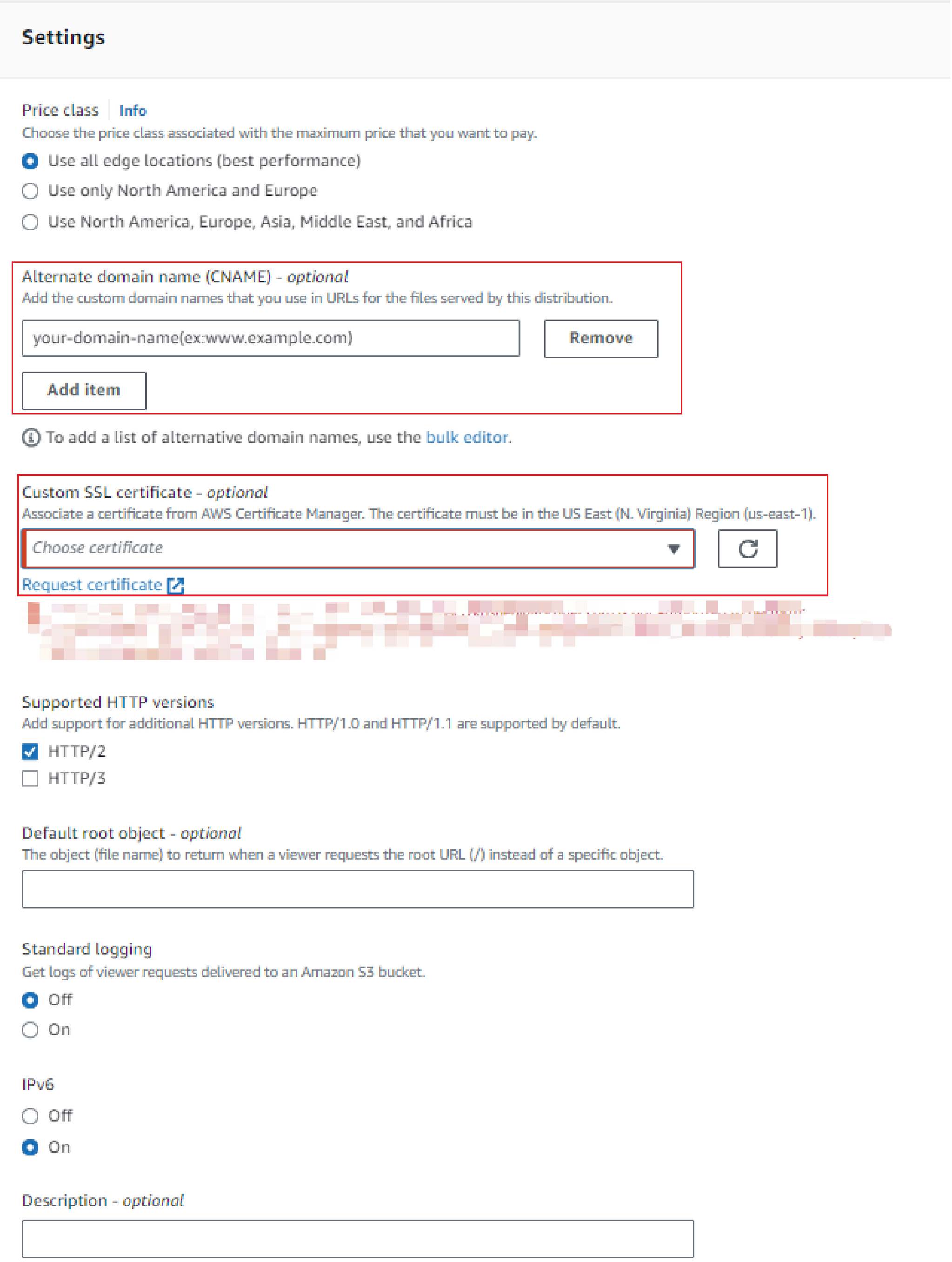
Web Application Firewall (WAF) Info

○ Enable security protections
Keep your application secure from the most common web threats and security vulnerabilities using AWS WAF. Blocked requests are stopped before they reach your web servers.

● Do not enable security protections
Select this option if your application does not need security protections from AWS WAF.

5. Configure the following options as described. You can set any option not specified here according to your preference. Refer to AWS online help for more information.

Settings	
Alternate Domain Names (CNAMEs)	Enter an additional domain name (e.g., www.example.com) that users use to access your application. FortiAppSec Cloud supports multiple domain names for a single application.
SSL Certificate	Select Custom SSL Certificate to upload the SSL certificate.



Settings

Price class Info

Choose the price class associated with the maximum price that you want to pay.

● Use all edge locations (best performance)

○ Use only North America and Europe

○ Use North America, Europe, Asia, Middle East, and Africa

Alternate domain name (CNAME) - *optional*

Add the custom domain names that you use in URLs for the files served by this distribution.

your-domain-name(ex:www.example.com)

To add a list of alternative domain names, use the bulk editor.

Custom SSL certificate - *optional*

Associate a certificate from AWS Certificate Manager. The certificate must be in the US East (N. Virginia) Region (us-east-1).

Choose certificate

[redacted]

Supported HTTP versions

Add support for additional HTTP versions. HTTP/1.0 and HTTP/1.1 are supported by default.

☑ HTTP/2

□ HTTP/3

Default root object - *optional*

The object (file name) to return when a viewer requests the root URL (/) instead of a specific object.

Standard logging

Get logs of viewer requests delivered to an Amazon S3 bucket.

● Off

○ On

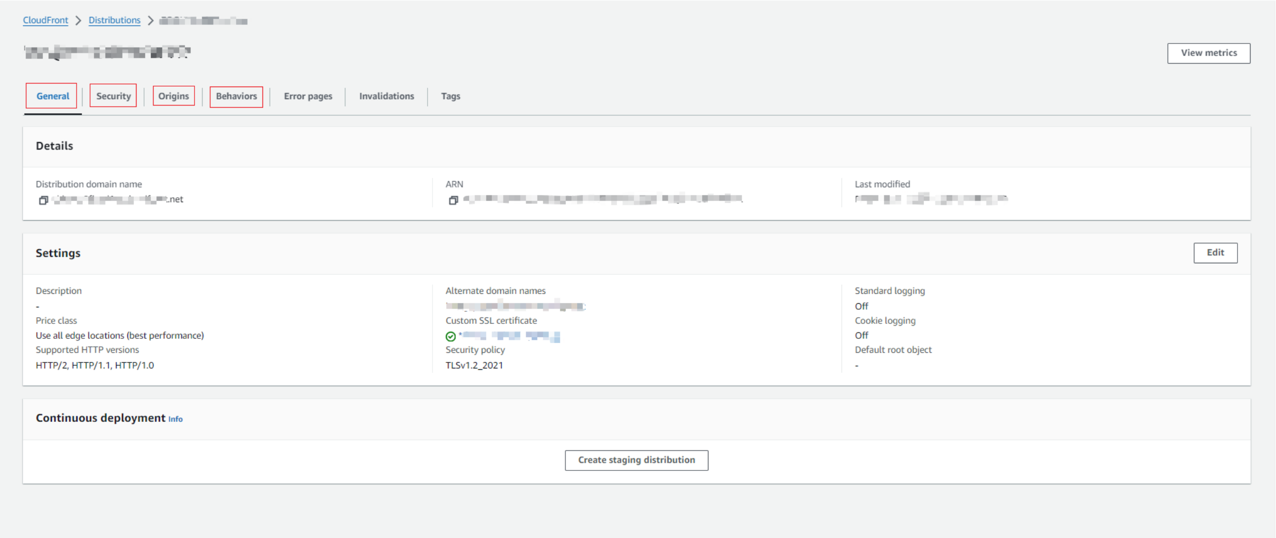
IPv6

○ Off

● On

Description - *optional*

6. Modify your existing CloudWatch distributions by clicking into the tabs outlined below. Additionally, you can consult the configuration details provided in steps 3-5 above.
   - **General**: Settings configurations (details in Settings on page 165).
   - **Security**: WAF configurations (details in WAF options).
   - **Origins**: Origin configurations (details in Origin on page 161).
   - **Behaviors**: Default Cache Behaviors Configurations (details in Default Cache Behavior on page 162).



Details

Distribution domain name
[redacted].net

ARN
[redacted]

Last modified
[redacted]

Settings

Description
-

Price class
Use all edge locations (best performance)

Supported HTTP versions
HTTP/2, HTTP/1.1, HTTP/1.0

Alternate domain names
[redacted]

Custom SSL certificate
[redacted]

Security policy
TLSv1.2_2021

Standard logging
Off

Cookie logging
Off

Default root object
-

Continuous deployment

Modifying DNS record to use the domain name provided by CloudFront

Go to your DNS service to modify the DNS record to route queries for the your application's domain name (e.g. www.example.com) to the CloudFront domain name (e.g. d1234.cloudfront.net).

If you use AWS Route 53, refer to Working with Records on how to create or change the DNS records.

At this point, the queries to your application's domain name should successfully be forwarded to CloudFront first, then reach FortiAppSec Cloud.

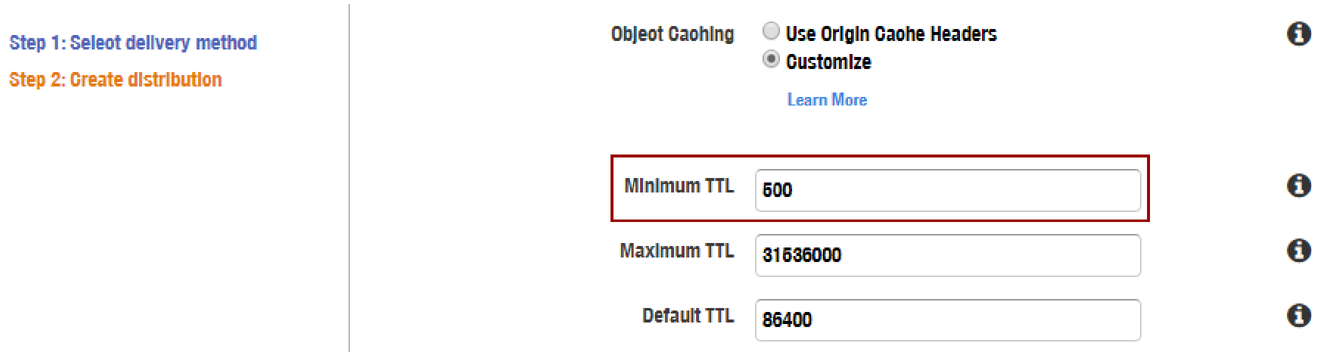
Configuring Error Pages

When FortiAppSec Cloud detects a violation to its security rules, it takes appropriate actions, such as blocking the request and returning an error code to the client who initiated this request. The error code is cached in CloudFront, so that when the same client initiates the same request next time, CloudFront can directly return this error code to the client.

However, the request might be falsely detected as a violation. You can add the request as an exception in FortiAppSec Cloud so that it will not be detected as a violation next time, but, if you have set a long Minimum TTL, the client may keep receiving the cached error code until the minimum TTL passes. During this period, CloudFront uses the cached error code to respond to the subsequent requests instead of forwarding them to FortiAppSec Cloud for re-processing.

In most cases, the minimum TTL in the distribution settings is set to a long time value because for efficiency considerations you may not want CloudFront to renew its caches too frequently, so, the optimal solution for the above mentioned error code caching problem is to set a comparatively shorter Minimum TTL specially for error codes.

In the following example shown in the screenshots, the Minimum TTL in the distribution is set to 500 seconds, while the Minimum TTL for the error code is set much shorter to 30 seconds. This distinguishes the minimum TTL time for error codes and the rest content. The objects such as the rarely changing icons and background images stay in cache for a long time, while the error codes frequently renews.



Step 1: Select delivery method

Step 2: Create distribution

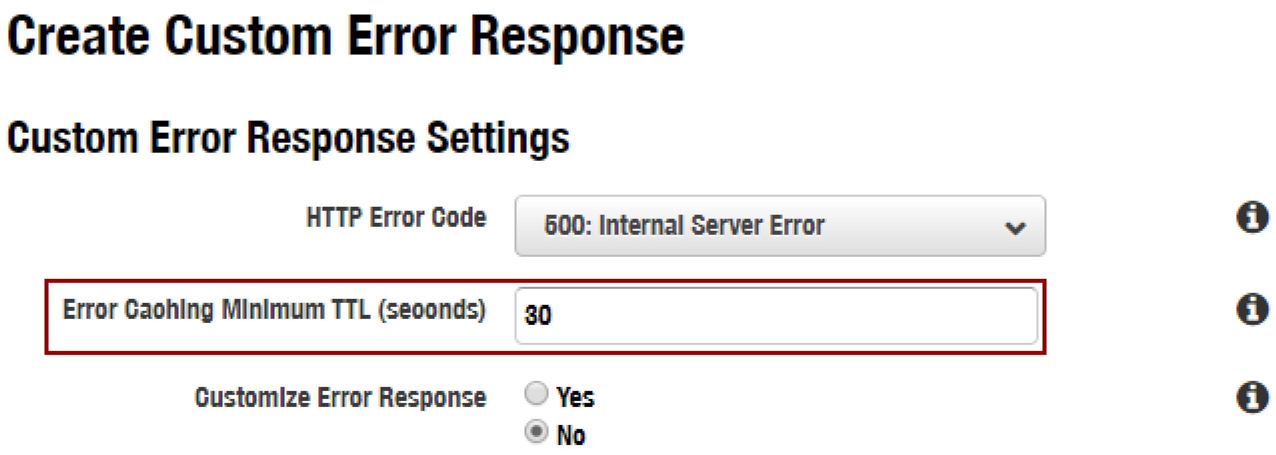
Object Caching ○ Use Origin Cache Headers ● Customize

Learn More

Minimum TTL: 500

Maximum TTL: 31536000

Default TTL: 86400



Create Custom Error Response

Custom Error Response Settings

HTTP Error Code: 500: Internal Server Error

Error Caching Minimum TTL (seconds): 30

Customize Error Response ○ Yes ● No

To set the Minimum TTL for error pages:

1. In the distribution list, find the distribution you just created. Click its ID to open the distribution details page.
2. Select **Error Pages** tab.
3. Click **Create Custom Error Response** to create a new error page, or click an existing error page to edit its Minimum TTL.
4. Set **Error Caching Minimum TTL (Seconds)**.
5. Configure other options as desired.
6. Click **Create**.

After you complete the settings above, you can go ahead configure security rules in FortiAppSec Cloud to protect your application.

FortiAppSec Cloud has a security module called Caching and Compression. It allows you to cache and compress objects that rarely change, such as icons, background images, movies. If you have configured CloudFront to cache such objects, you can disable this module in FortiAppSec Cloud.

Network settings for applications serving different content over HTTP and HTTPS

In most cases, when users enter the application's domain name over either HTTP or HTTPS, the same content is returned. However, if you have configured your application server to serve different content over HTTP and HTTPS protocols, you should configure the network settings in FortiAppSec Cloud as described below.

In the following example, Server Balance is turned off, causing all HTTP traffic to route through Port 80, while HTTPS traffic is routed through Port 443.

Endpoints

In **Network > Endpoints**, or in the **Network Settings** step of the **Web Application Configuration wizard**, enable **HTTP** and **HTTPS**. Disable **Redirect all HTTP traffic to HTTPS**.

Servers

FortiAppSec Cloud communicates with your application server over both HTTP and HTTPS protocols when there is only one origin server.

Disabling server balance

After the application is onboarded, **Server Balance** is enabled by default to apply load balancing algorithm to multiple servers. As only one server is allowed if you want FortiAppSec Cloud to communicate with the origin server over both HTTP and HTTPS, you need to disable **Server Balance**.

1. In **Network > Origin Servers**, click the **Edit** icon.
2. Turn off **Server Balance**. Please note the existing origin servers will all be deleted. You can add one server later.
3. Click **OK**.

Creating server

Add a single server and specify the HTTP and HTTPS ports.

1. In **Network > Origin Servers**, click **Create Server**.
2. Refer to Origin Servers on page 68 to configure server settings. Make sure to specify both HTTP and HTTPS port numbers. If you haven't disabled **Server Balance**, only one port is allowed to be configured on this page.
3. Click **OK**.

Multiple domains sharing the same IP address

If you have multiple root domain names pairing with the same IP address, for example, both example1.com and example2.com map to 192.168.1.1, then follow the instructions below.

Onboarding applications

Even though there are multiple domains pairing with the same IP address, you only need to onboard one application, so that FortiAppSec Cloud knows the IP address to protect.

As long as the traffic is destined to this IP address, FortiAppSec Cloud will apply the web protection rules to the traffic regardless whether the applications are onboarded.

Importing local certificates

For the applications that are not onboarded, you need to import their certificates through **Custom Certificate** in **Network > Endpoints**. The certificates are used to encrypt the HTTPS connections between your application users and FortiAppSec Cloud. Without a valid certificate, users will see a certificate invalid warning when they visit your application. For how to import certificates, see Endpoints on page 61.

Using WAF with Splunk

Splunk Inc. (NASDAQ: SPLK) is the market leader in analyzing machine data to deliver Operational Intelligence for security, IT and the business. Splunk® software provides the enterprise machine data fabric that drives digital transformation. Splunk Enterprise makes it simple to collect, analyze and act upon the untapped value of the big data generated by your technology infrastructure, security systems and business applications—giving you the insights to drive operational performance and business results.

FortiAppSec Cloud App for Splunk

The FortiAppSec Cloud App provides real-time and historical dashboard on threats, performance metrics and audit information for FortiAppSec Cloud.

With the massive set of logs and big data aggregation through Splunk, the FortiAppSec Cloud App for Splunk is certified with pre-defined threat monitoring and performance indicators that help guide network security . As the de facto trending dashboard for many enterprises or service providers, IT administrators can also modify the regular expression query to custom fit views for advanced security reporting and compliance mandates.
FortiAppSec Cloud App for Splunk: https://splunkbase.splunk.com/app/4627/

FortiAppSec Cloud WAF App depends on the Add-on to work properly. Make sure Fortinet FortiAppSec Cloud Add-on for Splunk has been installed before you proceed.

FortiAppSec Cloud Add-on for Splunk

FortiAppSec Cloud WAF Add-On for Splunk is the technical add-on (TA) developed by Fortinet, Inc. The add-on enables Splunk Enterprise to ingest or map security and audit data collected from FortiAppSec Cloud, which includes attack and audit logs.

Fortinet FortiWebCloud Add-on for Splunk: https://splunkbase.splunk.com/app/4626/

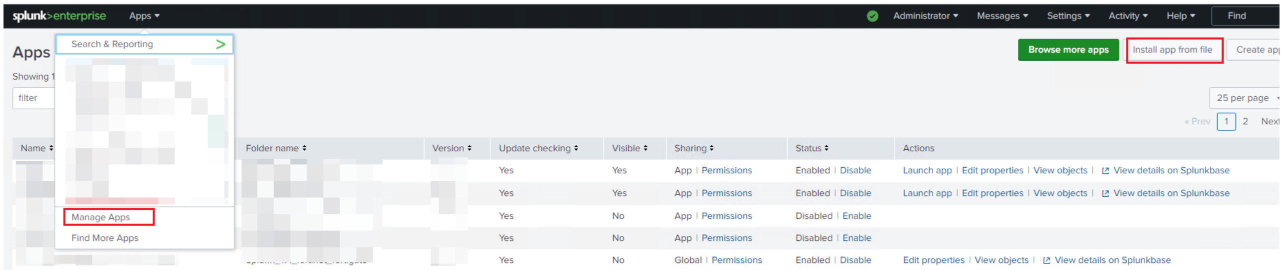
Deployment prerequisites

1. Splunk version 8.1.0 or later
2. FortiWeb Cloud Add-On for Splunk (https://splunkbase.splunk.com/app/4626)
3. FortiWeb Cloud App for Splunk (https://splunkbase.splunk.com/app/4627)
4. A Splunk.com username and password

Splunk configuration

1. Click the gear (Manage Apps) from Splunk Enterprise.
2. Click **Browse more apps**, and search for FortiWeb Cloud
3. Install **Fortinet FortiWeb CloudAdd-on for Splunk**
4. Install **Fortinet FortiWeb Cloud App for Splunk**.

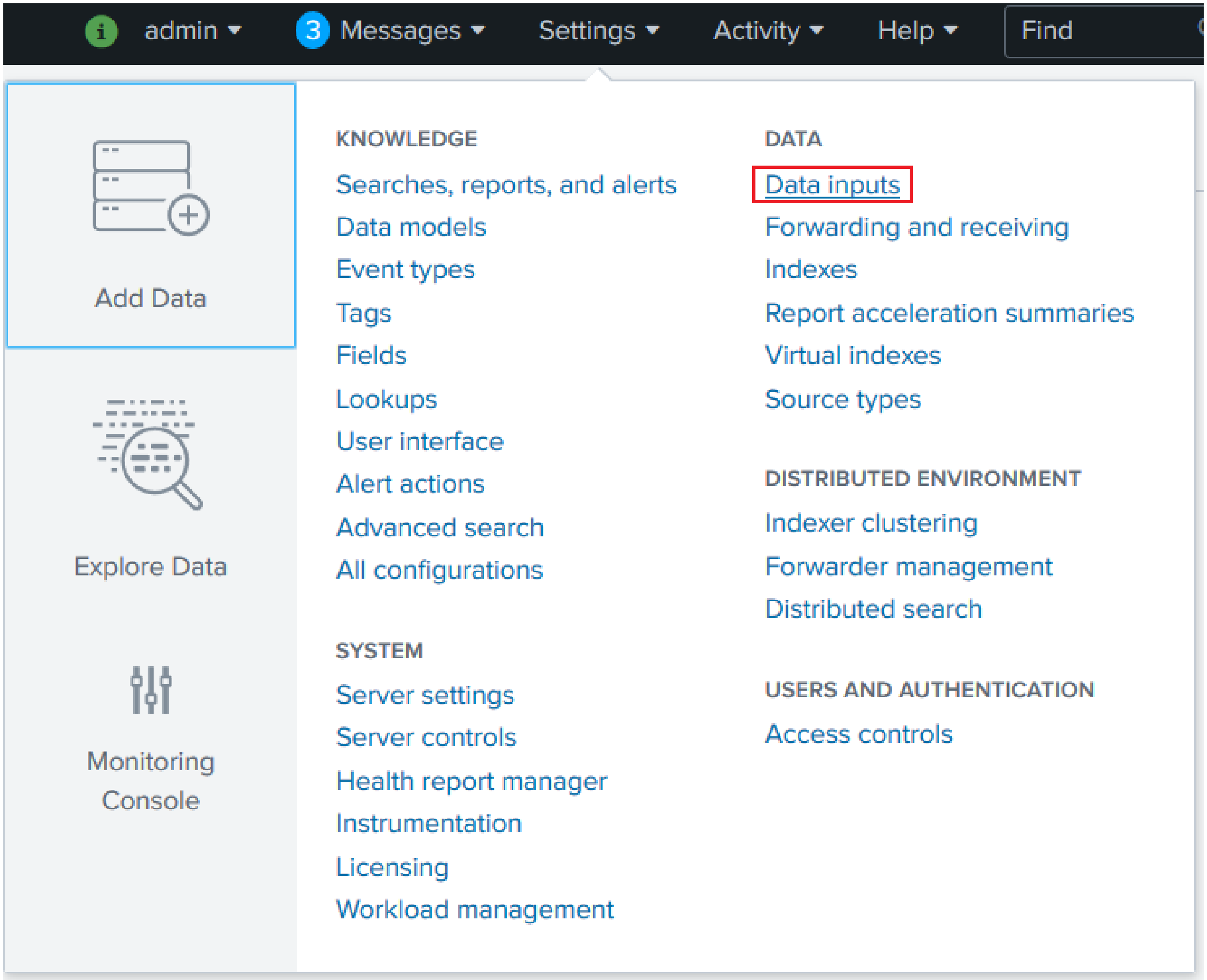
   Note: If the **Fortinet FortiWeb Cloud App for Splunk** and **Fortinet FortiWeb Cloud Add-on for Splunk** cannot be installed from **Browse more apps**, please go to Splunkbase, download the Add-on and App (two .tgz files), then install them by clicking the gear (Manage Apps) > **Install app from file**



Name	Folder name	Version	Update checking	Visible	Sharing	Status	Actions
[redacted]	[redacted]	[redacted]	Yes	Yes	App | Permissions	Enabled | Disable	Launch app | Edit properties | View objects | View details on Splunkbase
[redacted]	[redacted]	[redacted]	Yes	Yes	App | Permissions	Enabled | Disable	Launch app | Edit properties | View objects | View details on Splunkbase
[redacted]	[redacted]	[redacted]	Yes	No	App | Permissions	Disabled | Enable	
[redacted]	[redacted]	[redacted]	Yes	No	App | Permissions	Disabled | Enable	
[redacted]	[redacted]	[redacted]	Yes	No	Global | Permissions	Enabled | Disable	Edit properties | View objects | View details on Splunkbase

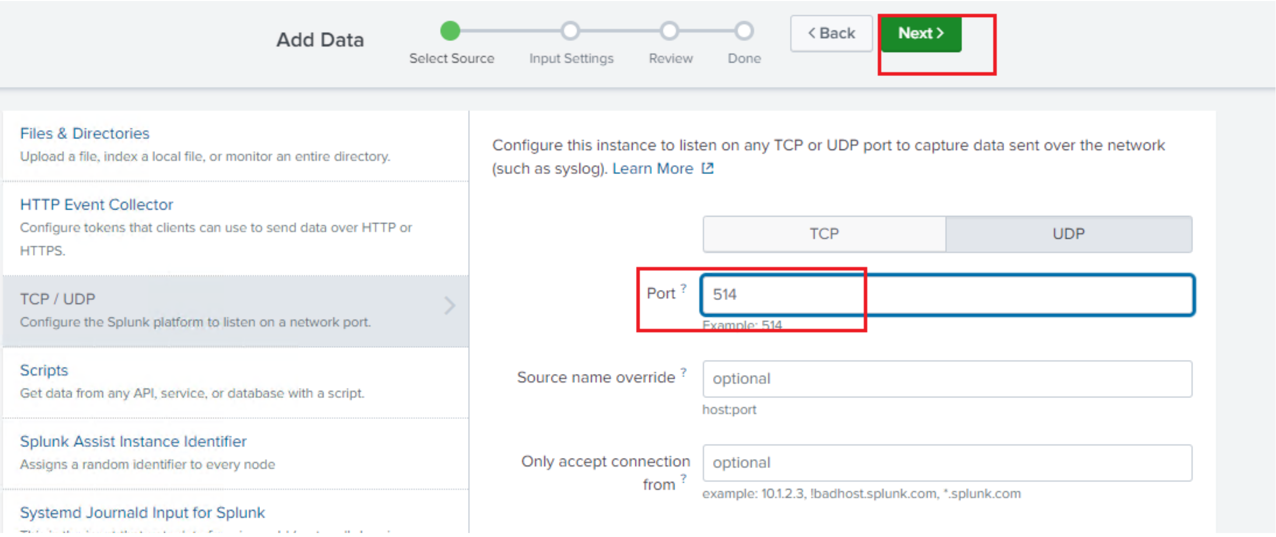
5. Restart Splunk Enterprise.

6. From **Settings**, click **Data Inputs** under **Data**.



7. Click **Add new** in the UDP or TCP line to create a new input rule with corresponding protocol. See the UDP protocol example below.

8. Create a UDP data source. In the example below, we have used Port 514. Afterwards, click **Next**.



Add Data
Select Source
Input Settings
Review
Done
< Back
Next >
Files & Directories
Upload a file, index a local file, or monitor an entire directory.
HTTP Event Collector
Configure tokens that clients can use to send data over HTTP or HTTPS.
TCP / UDP
Configure the Splunk platform to listen on a network port.
Scripts
Get data from any API, service, or database with a script.
Splunk Assist Instance Identifier
Assigns a random identifier to every node
Systemd Journald Input for Splunk
TCP
UDP

Configure this instance to listen on any TCP or UDP port to capture data sent over the network (such as syslog). Learn More

Port: 514
Example: 514

Source name override: optional
host:port

Only accept connection from: optional
example: 10.1.2.3, !badhost.splunk.com, *.splunk.com

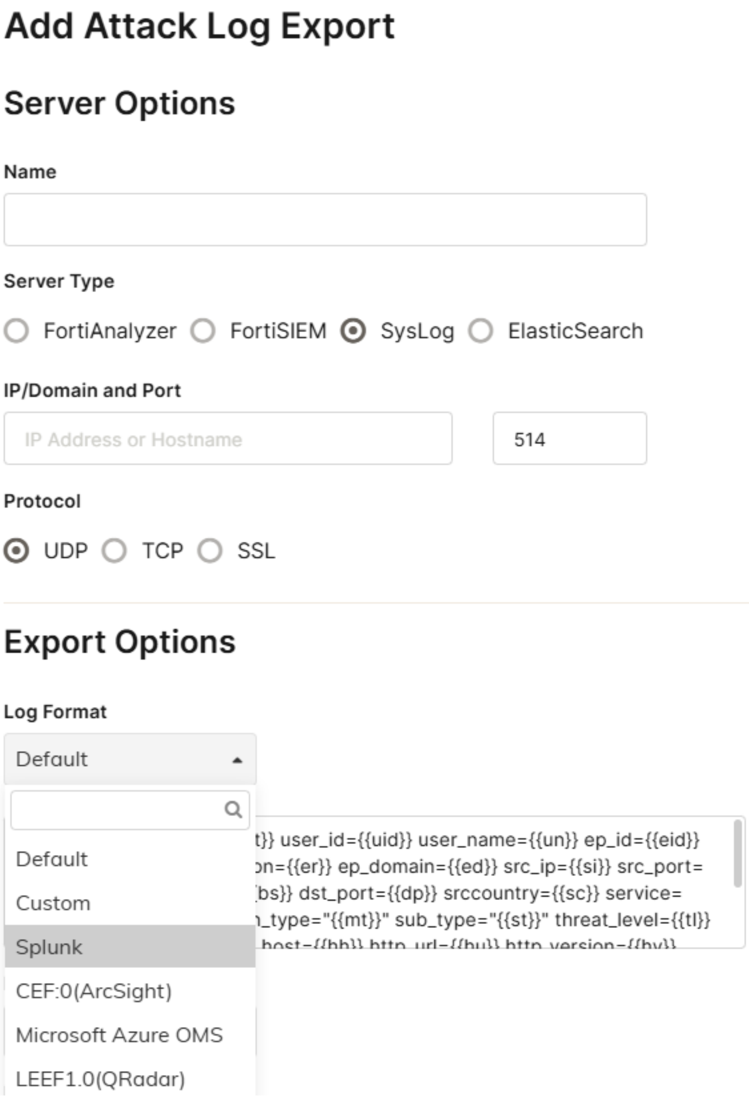
9. For **Source type**, click the **Select** tab then click **Select Source Type**. Enter "fwbcld" in the filter box, and select **fwbcld_log**.
   By default, **Fortinet FortiWeb Cloud App for Splunk** will automatically extract FortiWebCloud log data from inputs with source type 'fwbcld_log'.
10. For **App context**, select Fortinet FortiWebCloud App for Splunk FortiWeb Cloud App for Splunk.
11. Click **Review** to check the items.
12. Click **Submit**.

FortiAppSec Cloud configuration

Configure FortiAppSec Cloud to send logs to Splunk server.

Attack logs

1. Go to **Log Settings**.
2. Enable **Attack Log Export**.
3. Click **Add Log Server**.
4. Configure the server and export options. See Exporting attack logs on page 52 for details.
   For Log Format, select **Splunk**.



Add Attack Log Export

Server Options

Name

Server Type

○ FortiAnalyzer ○ FortiSIEM ● SysLog ○ ElasticSearch

IP/Domain and Port

IP Address or Hostname | 514

Protocol

● UDP ○ TCP ○ SSL

Export Options

Log Format

Default

Default
Custom
Splunk
CEF:0(ArcSight)
Microsoft Azure OMS
LEEF1.0(QRadar)

```
t}} user_id={{uid}} user_name={{un}} ep_id={{eid}}
on={{er}} ep_domain={{ed}} src_ip={{si}} src_port=
bs}} dst_port={{dp}} srccountry={{sc}} service=
_type="{{mt}}" sub_type="{{st}}" threat_level={{tl}}
host={{hh}} http_url={{hu}} http_version={{hv}}
```

Logs verification on Splunk server

To verify whether logs have been received by Splunk server

1. On Splunk web UI, go to **Apps > Search & Reporting**.
2. If attack logs have been sent to Splunk, enter **'sourcetype="fwbcld_attack"'** in the search box. Change the time range if necessary. The attack logs will be listed below.
3. If audit logs have been sent to Splunk, enter **'sourcetype="fwbcld_event"'** in the search box. Change the time range if necessary. The audit logs will be listed below.
4. Go to the dashboard of Fortinet FortiWebCloud App for Splunk FortiAppSec Cloud App for Splunk, from the **Security Overview**, **Attack**, and **Event** tabs, you can see data parsed and presented.

Troubleshooting

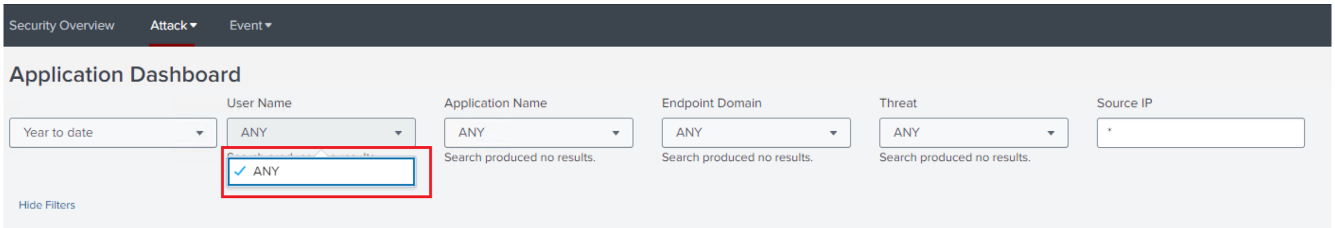
If data is not showing up in the Dashboards:

- Go to **Settings > Data Inputs**. Verify that you have a UDP data input enabled on port ,for example, 514.
- Go to **Settings > Indexes**. Verify that your Index (typically main) is receiving data and that the Latest Event is recent. If not, verify the FortiAppSec Cloud Syslog settings are correct and that it can reach the Splunk server.
- Verify that the port used for data input is accessible in your security group of the Splunk server.
- Ensure that the FortiAppSec Cloud service Management IP addresses are in the white list of your Splunk server.
- Verify the Splunk server is listening to the correct port.

If the App and Add-on cannot be installed from **Browse more**:

- Go to Splunkbase, download the Add-on and App (two .tgz files), then install them by clicking the gear (Manage Apps) > **Install app from file**.

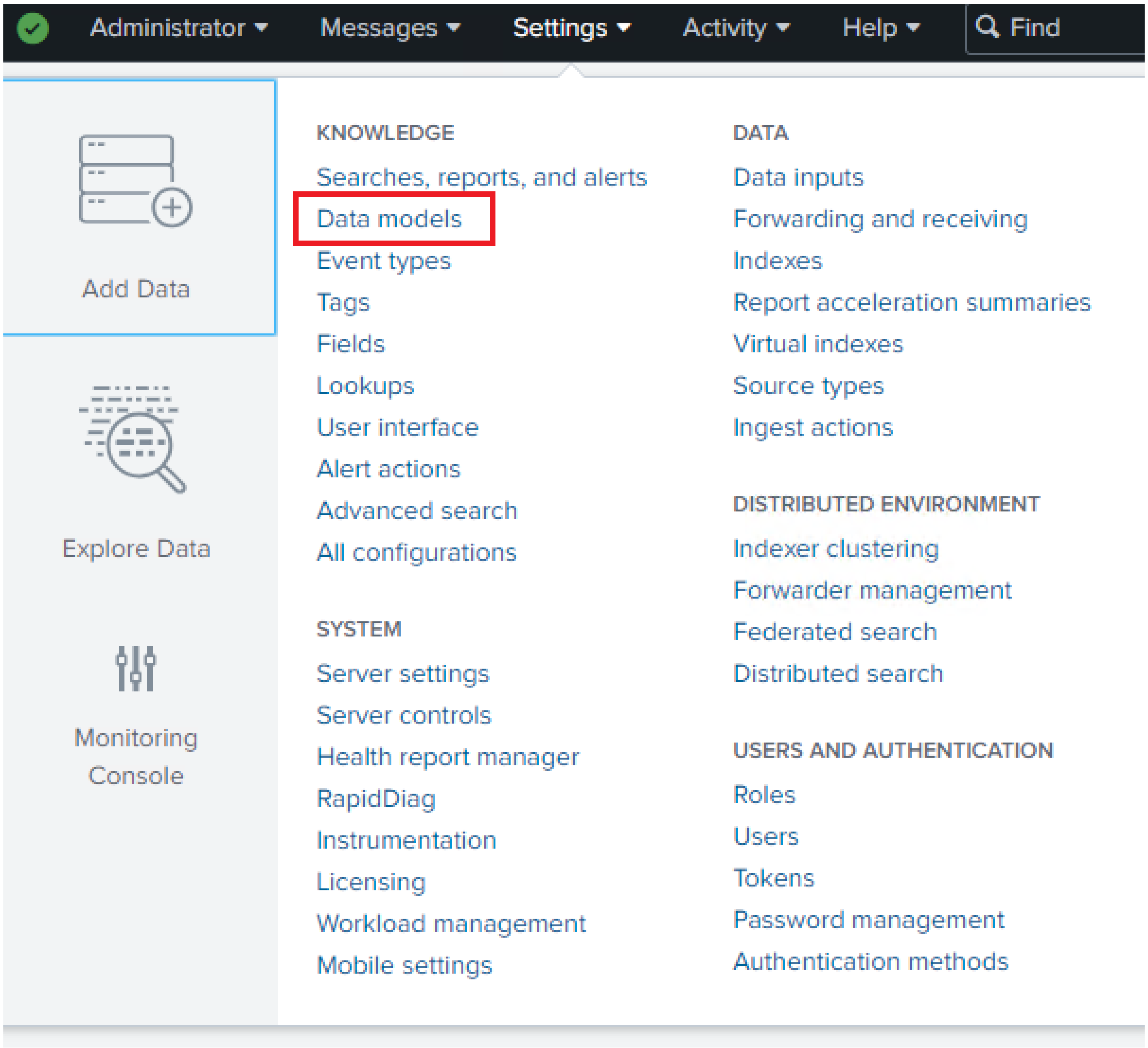
If the dropdown in Attack or Event dashboards does not have value:



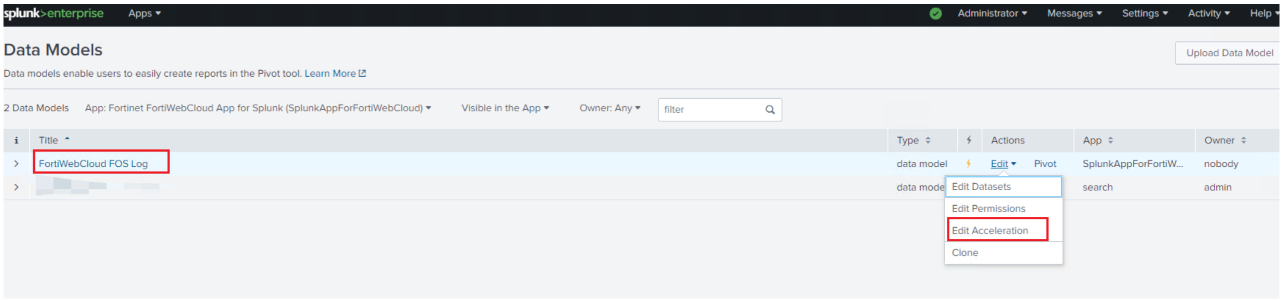
Application Dashboard

	User Name	Application Name	Endpoint Domain	Threat	Source IP
Year to date	ANY	ANY	ANY	ANY	*
	✓ ANY	Search produced no results.	Search produced no results.	Search produced no results.	

a. Go to **Settings > Data models**



b. Find **FortiAppSec Cloud FOS** Log, click **Edit > Edit Acceleration**



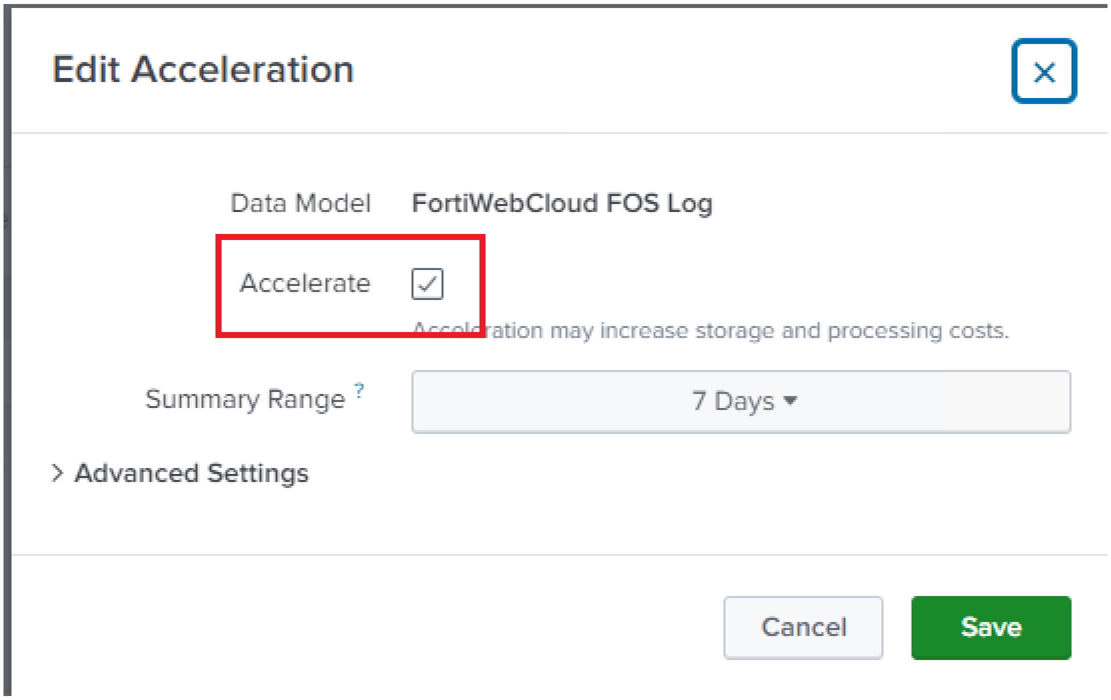
Data Models

Data models enable users to easily create reports in the Pivot tool. Learn More

2 Data Models   App: Fortinet FortiWebCloud App for Splunk (SplunkAppForFortiWebCloud) ▾   Visible in the App ▾   Owner: Any ▾

i	Title	Type	⚡	Actions	App	Owner
>	FortiWebCloud FOS Log	data model	⚡	Edit ▾ Pivot	SplunkAppForFortiW...	nobody
>	[redacted]	data mode			search	admin

c. Enable **Accelerate**, then wait for 5 mins or restart Splunk. You will see the dropdown in App.



Edit Acceleration

Data Model FortiWebCloud FOS Log

Accelerate ☑

Acceleration may increase storage and processing costs.

Summary Range 7 Days

Connecting WAF to the Fortinet Security Fabric

FortiAppSec Cloud supports Fortinet Security Fabric. You can configure FortiGate to view statistics of sites secured by WAF from the FortiGate Dashboard page.

Add WAF device to the Security Fabric

1. Ensure your FortiGate is running version 7.0.0 or newer, as older versions are no longer supported.
   Check your FortiGate version in the GUI by going to **Dashboard > Status**. The **Firmware** field in the **System Information** widget shows the version along with the build number.
2. Configure your FortiGate firewall or security group to allow access for the fabric connector's IPs: 3.226.2.163 and 3.123.68.65.
3. Ensure that the Security Fabric is enabled on FortiGate. See the FortiGate Administration Guide for more information.
4. On the root FortiGate of the Security Fabric, make sure **Allow other Security Fabric devices to join** is enabled.
5. On the root FortiGate, ensure that the appropriate interface is enabled to listen for supported Fabric devices.
6. Configure the FortiGate information on FortiAppSec Cloud's WAF service.
   a. Login to your FortiAppSec Cloud account, and go to **Global> System Settings > settings**.
   b. Scroll down to Fabric Connector and click **Create**. The **Add FortiGate Information** pane opens.
   c. Enter the management IP of your fabric connector. The Port number is set to 8013 by default.
7. Access the FortiGate GUI and wait for the connection request to appear, typically within a minute after completing the previous step.
8. After approving the connection request, you can access the dashboard of the newly added fabric connector, which is customizable with widgets. For further details, see Dashboards and Monitors.

Add dashboard widget for the FortiAppSec Cloud device

1. Select a dashboard in the tree menu of the FortiGate GUI.
2. In the banner, click **Add Widget**. The **Add Dashboard Widget** pane opens.
3. Select **Fabric Device** in Security Fabric.
4. Select the desired device and the widget name.
5. Click **Add Widget**.
   You can add multiple widget names.

View statistics of sites secured by FortiAppSec Cloud

1. Go to **Dashboard**.
2. Click the dashboard's name.
   You can now see the incoming requests, server status, threats, and throughput, etc. of the sites.

Managing External IdP roles in FortiCloud IAM

FortiCloud enables you to access and manage all of FortiAppSec Cloud's Cloud Services, including FortiAppSec Cloud, through a single account. When you access FortiAppSec Cloud, the login is authenticated through your FortiCloud account.

FortiCloud offers the IAM feature that enables you to create and manage External IdP roles that allow users from your organization to log in to the FortiAppSec Cloud portal using the user credentials with your organization's ID provider. External IdP users are authenticated by your organization's ID provider. After the user is authenticated, they can access FortiAppSec Cloud based on their role.

This feature is only available for certain accounts upon request. Submit a support ticket to request setup.

When an IdP user clicks **Logout**, they are only logging out of the FortiAppSec Cloud portal, not your organization's ID provider.

Please see FortiCloud documentation for detailed instructions on Adding external IdP roles.

Frequently used regular expressions

Some elements occur often in FortiAppSec Cloud regular expressions, such as expressions to match domain names, URLs, parameters, and HTML tags. You can use these as building blocks for your own regular expressions.

To match...	You can use...
Line endings (platform-independent)	(\r\n)|\n|\r
Any alphanumeric character (ASCII only; e.g. does not match é or É)	[a-zA-Z0-9]

<table>
<tr><th>To match...</th><th>You can use...</th></tr>
<tr><td>Specific domain name
(e.g. www.example.com; case insensitive)</td><td>(?i)\bwww\.example\.com\b</td></tr>
<tr><td>Any domain name
(valid non-internationalized TLDs only; does **not** match domain names surrounded by letters or numbers)</td><td>(?i)\b.*\.(a(c|d|e(ro)?|f|g|i|m|n|o|q|r|s(ia)?|t|y|w|x|z)|b(a|b|d|e|f|g|h|i(z)?|j|m|n|o|r|s|t|v|w|y|z)|c(a(t)?|c|d|f|g|h|i|k|l|m|n|o((m)?(op)?)|r|s|u|v|x|y|z)|d(e|j|k|m|o|z)|e(c|du|e|g|h|r|s|t|u)|f(i|j|k|m|o|r)|g(a|b|d|e|f|g|h|i|l|m|n|ov|p|q|r|s|t|u|w|y)|h(k|m|n|r|t|u)|i(d|e|l|m|n(fo)?(t)?|o|q|r|s|t)|j(e|m|o(bs)?|p)|k(e|g|h|i|m|n|p|r|w|y|z)|l(a|b|c|i|k|r|s|t|u|vy)|m(a|c|d|e|g|h|il|k|l|m|n|o(bi)?|p|q|r|s|t|u(seum)?|v|w|x|y|z)|n(a(me)?|c|e(t)?|f|g|i|l|o|p|r|u|z)|o(m|rg)|p(a|e|f|g|h|k|l|m|n|r(o)?|s|t|w|y)|qa|r(e|o|s|u|w)|s(a|b|c|d|e|g|h|i|j|k|l|m|n|o|r|s|t|u|v|y|z)|t(c|d|el|f|g|h|j|k|l|m|n|o|p|r(avel)?|t|v|w|z)|u(a|g|k|s|y|z)|v(a|c|e|g|i|n|u)|w(f|s)|xxx|y(e|t|u)|z(a|m|w))\b</td></tr>
<tr><td>Any sub-domain name</td><td>(?i)\b(.*)\.example\.com\b</td></tr>
<tr><td>Specific IPv4 address</td><td>\b10\.1\.1\.1\b</td></tr>
<tr><td>Any IPv4 address</td><td>\b(25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)\.(25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)\.(25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)\.(25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)\b</td></tr>
<tr><td>Specific HTML tag
(well-formed HTML only, e.g. `<br>` or `<img src="1.gif" />`; does **not** match the element’s contents between a tag pair; does **not** match the closing tag)</td><td>(?i)<\s*TAG\s*[^>]*></td></tr>
<tr><td>Specific HTML tag pair and contained text/tags, if any
(well-formed HTML only; expression does **not** validate by DTD/Schema)</td><td>(?i)<\s*(TAG)\s*[^>]*>[^<]*</\1></td></tr>
<tr><td>Any HTML tag pair and contained text/tags, if any
(well-formed HTML only; expression does **not** validate by DTD/Schema)</td><td>(?i)<\s*([A-Z][A-Z0-9]*)\b[^>]*>(.*?)</\1></td></tr>
<tr><td>Any HTML comment</td><td>(?:<|<)!--[\s\S]*?--[\t\n\r]*(?:>|>)</td></tr>
<tr><td>Any HTML entity
(well-formed entities only; expression does **not** validate by DTD/Schema)</td><td>&(?i)(#((x([\dA-F]){1,5})|(104857[0-5]|10485[0-6]\d|1048[0-4]\d\d|104[0-7]\d{3}|10[0-3]\d{4}|0?\d{1,6}))|([A-Za-z\d.]{2,31}));</td></tr>
<tr><td>JavaScript UI events
(`onClick()`, `onMouseOver()`, etc.)</td><td>(?i):on(blur|c(hange|lick)|dblclick|focus|keypress|(key|mouse)(down|up)|(un)?load|mouse(move|o(ut|ver))|reset|s(elect|ubmit))</td></tr>
<tr><td>All parameters that follow a question mark or hash mark in the URL</td><td>[#\?](.*)</td></tr>
</table>

To match...	You can use...
(e.g. `#pageView` or `?param1=valueA&param2=valueB`...; back-reference to this match does not include the question/hash mark itself)	

Configuring WAF with Terraform

Terraform is a DevOps tool that integrates with FortiAppSec Cloud using the FortiAppSec Cloud Terraform Provider, which automates the provisioning and management of FortiAppSec Cloud WAF resources.

Prerequisites for using Terraform with WAF

- FortiAppSec Cloud API access.
- FortiAppSec Cloud Provider version 1.0.0 or later.
- Terraform version 0.13 or later.
- Terraform template for setting up WAF
  - Download the template by following the instructions under **Installation** on the Github repository.
  - Obtain a template from the support team or your sales engineer.

Configuration Instructions

For setup instructions on using FortiAppSec Cloud WAF with Terraform, please refer to the following external resources:

- **Creating new applications:** with Terraform, please see the README section of our GitHub repository, referring to Terraform documentation for Argument References covering OpenAPI validation and application creation use cases.
- **Migrating pre-existing Terraform integration settings from FortiWeb Cloud:** please refer to the instructions under Migrate FortiWebCloud private provider to FortiAppSecCloud.

State File Backup: Before modifying the state file, ensure it is backed up to prevent data loss.

Best practices

The following topics introduce the best practices when using FortiAppSec Cloud.

- Using Dashboard to monitor important notices
- Utilizing FortiViewThreatView to reduce false positives
- Setting up a secure environment

Using Dashboard to monitor important notices

The Dashboard page displays the application's request and threat data, and other important statistics.

Threat data

The Threat Level and Threat Level History widgets display the threat scores of the application over a certain time range. FortiAppSec Cloud can send alerts to the specified email addresses if the threat score exceeds a certain level. For how to configure the alert email settings, see Configuring attack log alert.

Use the OWASP Top 10 Threats widget to investigate into the most critical attacks to your application. Click the threat category links to check the details such as the source IP and affected URLs.

Statistics on requests

The following widgets display the number of requests to the application, and how many requests are blocked by FortiAppSec Cloud.

You can use the time range selector in the Incoming Requests widget to view the number of allowed and blocked requests over the last hour, 24 hours, 7 days, and 14 days.

Monitoring server status

The Server Status widget displays whether the origin server is available. In the following example, the server is available (), while the health check is disabled ().

If you have multiple origin servers, it's recommended to enable Health Check, so that when a server becomes unavailable FortiAppSec Cloud can distribute its traffic to other servers.

Utilizing FortiViewThreatView to reduce false positives

Sometimes legitimate traffic may be detected as attacks if inappropriate thresholds are set in the security rules. Moreover, even regular users may violate the rules due to the nature of some web pages, such as the stock list web page, where users can be identified as bots because they tend to frequently refresh the pages.

To avoid legitimate traffic being blocked, it's recommended to regularly check the attack statistics in FortiViewThreatView. It provides deep insights in the attack information and helps you figure out the false positives.

For example, if the attacks are originated from many different source IPs, but they affect the same URL, this might be false positives. It can be caused by the nature of the web page itself that the regular traffic behaves like attacks. You can investigate the issue by clicking source IPs on the **Threat by Source IPs** page. If the **URLs** tab of many source IPs shows the same URL, you may consider whether they are false positives.

If the false positives are of the **Known Attacks** type, you can click **Add Exception** beside the signature ID. The traffic to that URL will no longer be treated as an attack even if it matches the signatures.

If the false positives are of other types, you can edit the corresponding security rules to add this URL as an exception.

The method mentioned above is just an example. Go ahead explore more ways to utilize FortiViewThreatView for false positive investigation.

Setting up a secure environment

FortiAppSec Cloud provides features such as Two-Factor Authentication (2FA), Role Management, etc. for you to secure your account and restrict permissions for the administrators.

With 2FA enabled, your account will be secured not only by the account credential, but also by a dynamic code generated on the 2FA device. See Two-Factor Authentication.

If you have multiple administrators managing your account, it's a good practice to create roles for them to access different applications in your account or distinguish them with read-only or read-write permissions. See Role management.

How to block the ongoing DDoS attack

To identify the characteristics of HTTP requests in a DDoS attack and add security rules to defend against it, the following methods can be used to analyze the attack and set up rules to block it:

- STEP 1: Limiting the frequency and blocking source IP addresses
- STEP 2: Blocking requests based on user-agent, parameters, HTTP headers, etc.
- STEP 3: Blocking bots

STEP 1: Limiting the frequency and blocking source IP addresses

Check the server's HTTP access logs to examine the frequency and source IP address of requests. Attackers often flood the server with a large number of fake requests, so it is possible to identify malicious requests based on their frequency and source IP address.

The following rules can be set on FortiAppSec Cloud to limit the frequency and block the source IPs:

- **DDoS Prevention**

  Set up rules to limit the frequency of HTTP requests and TCP connections (e.g., set the limit to 50).

  For more information, see DDoS prevention

- **Access Rules > IP Protection**

1. Enable **IP Reputation** to block client access based on up-to-date threat intelligence.
2. Select the countries of origin for the attacks.
3. Add the source IP addresses of the attacks in the **IP List**.
   Please note that source IP blocking can also be set in **Advanced Applications > Custom Rule**.

For more information, see IP Protection.

STEP 2: Blocking requests based on user-agent, parameters, HTTP headers, etc.

- Analyze the user-agent field in the HTTP requests as attackers often use custom user-agents to hide their identity. Identify specific user-agents that are likely malicious.
- Check the parameters in the HTTP requests as attackers may use specific parameters to try to bypass security measures (e.g., look for common attack parameters like 'wp-admin').
- Use an HTTP header analyzer to examine the HTTP request headers in the attack, such as Accept-Encoding and Content-Encoding, as attackers may use compression techniques to hide their malicious code.

To accurately target the attacks, add corresponding filters in **Advanced Applications > Custom Rule** and set the action to **Period Block**.

For more information, see Custom Rule on page 126.

STEP 3: Blocking bots

- Some DDoS attacks come from known bots. Enable the following categories in **Bot Mitigation > Known Bots** and set the action to **Period Block**. For more information, see Known Bots.

- **Bot Mitigation > ML Based Bot Detection**

Enable **Machine Learning Based Bot Detection**. This complements existing signature and threshold-based rules to detect sophisticated bots that can sometimes go undetected.For more information, see Bot Mitigation on page 116.

Operational Guidelines

The following topics describe the Operational Guidelines for using FortiAppSec Cloud WAF.

- Maximum configuration values on page 182
- Sequence of scans on page 185
- Supported cipher suites & protocol versions on page 190

Maximum configuration values

The following table provides the maximum number of configuration objects in each application.

Application item	Maximum value
Logs > attack log servers	5
Network > origin servers	32
Network > Endpoint > Custom Certificate	32
Network > Endpoint > Intermediate Certificate	32
Network > Endpoint > Domains	10
Security Rules > Known Attack > Exception rules	128
Security Rules > Anomaly Detection > Source IP List	No Limit
Security Rules > Information Leakage > Exception rules	128
Security Rules > Cookie Security > Except Cookies	64
Client Security > CSRF Protection > Page List	256
Client Security > CSRF Protection > URL List	256
Client Security > MITB Protection > Protected Parameter	256
Client Security > MITB Protection > Allowed External Domains for AJAX Request	256
Access rules > URL access rules	12
Bot Mitigation > Biometrics Based Detection rules	12
Bot Mitigation > Bot Deception rules	255
Advanced Applications > Custom rules	12
Advanced Applications > Web Socket Security rules	12
API Protection > Open API Validation > Validation rules	10
API Protection > API Gateway > API users	12
API Protection > API Gateway > API Gateway rules	12
API Protection > Mobile API Protection Request URL	12
API Protection > JSON Security rules	10
API Protection > XML Protection rules	10
Application Delivery > Rewriting Request rules	12
Global Trustlist	12

The following table provides the maximum number of configuration objects in **Global** tabs.

Global item	Maximum value
WAF > Templates	16
WAF > Report	No Limit

Global item	Maximum value
WAF > Admin Management > Users	No Limit
WAF > Administrators > Role Management > Roles	No Limit
WAF > System Settings > Cloud Connectors	No Limit
WAF > System Settings > Custom Block Pages	8
WAF > System Settings > Settings > API Key	1

Sequence of scans

FortiAppSec Cloud applies protection rules and performs scans according to orders in the table below (from the top to the bottom).

You may find that the actual scan sequence sometimes is different from that listed in the following scan sequence table. Various reasons may explain this, for example, for the scans involving the whole request or response packet, its sequence may vary depending on when the packet is fully transferred to FortiAppSec Cloud. **File Protection** is one of the scan items that involve scanning the whole packet. FortiAppSec Cloud scans `Content-Type:` and the body of the file for File Protection. While the `Content-Type:` is scanned instantly, the body of the file may be postponed after the subsequent scans until the whole body of the file is done uploading to FortiAppSec Cloud.

Please also note that the scan sequence refers to the sequence within the same packet. For example, **TCP Connection Number Limit** precedes **HTTP Request Limit** in the scan sequence table. However, if there are two packets containing HTTP traffic and TCP traffic respectively, and the HTTP packet arrives first, FortiAppSec Cloud thus checks the **HTTP Connection Number Limit** first.

To improve performance, block attackers using the earliest possible technique in the execution sequence and/or the least memory-consuming technique. The blocking style varies by feature and configuration. For example, when detecting Syntax-based SQL injection, instead of blocking the SQL injection by its syntax, you could log and block the injection by the blocklist defined in IP List. For details, see each specific feature.

Scan/action	Involves
TCP Connection Number Limit (TCP Flood Prevention)	• Source IP address of the client in the IP layer. • Source port of the client in the TCP layer.
Add X-Forwarded-For:	• `X-Forwarded-For:` • `X-Real-IP:` • `X-Forwarded-Proto:`
IP List	• Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the `SRC` field in the IP header, or the `X-Forwarded-For:` and `X-Real-IP:` HTTP headers. For details, see Rewriting Requests on page 144. • Source IP address of the client in the IP layer. **Note:** If a source IP is in allowlist, subsequent checks will be skipped.
IP Reputation	Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the `SRC` field in the IP header, or the `X-Forwarded-For:` and `X-Real-IP:` HTTP headers. For details, see Rewriting Requests on page 144.
Geo IP	• Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the `SRC` field in the

Scan/action	Involves
	IP header, or the X-Forwarded-For: and X-Real-IP: HTTP headers. For details, see Rewriting Requests on page 144. - Source IP address of the client in the IP layer.
WebSocket security	- Host: - URL in HTTP header - Origin: - Upgrade: - Frame Size/Message Size - sec-websocket-extenstions
HTTP Allow Method	- Host: - URL in HTTP header - Request method in HTTP header
HTTP Request Limit (HTTP Flood Prevention)	- Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the SRC field in the IP header, or the X-Forwarded-For: and X-Real-IP: HTTP headers. For details, see Rewriting Requests on page 144. - Cookie: - Session state - URL in the HTTP header - HTTP request body
TCP Connection Number Limit (Malicious IP)	- Cookie: - Session state - Source IP address of the client in the IP layer - Source port of the client in the TCP layer
HTTP Request Limit (HTTP Access Limit)	- ID field of the IP header - Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the SRC field in the IP header, or the X-Forwarded-For: and X-Real-IP: HTTP headers. For details, see Rewriting Requests on page 144. . - HTTP request body
URL Access	- Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the SRC field in the IP header, or the X-Forwarded-For: and X-Real-IP: HTTP headers. For details, see Rewriting Requests on page 144. - Host: - URL in HTTP header - Source IP of the client in the IP header
Mobile API Protection	- Host: - URL in HTTP header - Token header

Scan/action	Involves
Protocol Limits	- Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the SRC field in the IP header, or the X-Forwarded-For: and X-Real-IP: HTTP headers. For details, see Rewriting Requests on page 144. - Content-Length: - Parameter length - Body length - Header length - Header line length - Count of Range: header lines - Count of cookies
File Protection	- Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the SRC field in the IP header, or the X-Forwarded-For: and X-Real-IP: HTTP headers. For details, see Rewriting Requests on page 144. - Content-Type: in PUT and POST requests - URL in HTTP header - The body of the file
Bot Deception	- Host: - URL in the HTTP header
Cross-site request forgery (CSRF) attacks	- <a href> - <form>
Protection for Man-in-the-Browser (MITB) attacks	- Host: - URL in HTTP header - Request method in HTTP header - Parameters in URL - Content-Type:
Biometrics Based Detection	- Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the SRC field in the IP header, or the X-Forwarded-For: and X-Real-IP: HTTP headers. For details, see Rewriting Requests on page 144. - URL - Host: - X-Forwarded-For:
XML Protection	- URL - HTTP header - Body
JSON Protection	- URL - HTTP header - Body
Signature Based Detection	- Source IP address of the client depending on your configuration of

Scan/action	Involves
	X-header rules. This could be derived from either the SRC field in the IP header, or the X-Forwarded-For: and X-Real-IP: HTTP headers. For details, see Rewriting Requests on page 144. • HTTP headers • HTML Body • URL in HTTP header • Parameters in URL and request body
SQL Syntax Based Detection	• Host: • Cookie: • URL in HTTP header • Parameters in URL and request body
Custom Rule	• Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the SRC field in the IP header, or the X-Forwarded-For: and X-Real-IP: HTTP headers. For details, see Rewriting Requests on page 144. • URL in the HTTP header • HTTP header • Parameter in the URL
Threshold Based Detection	• Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the SRC field in the IP header, or the X-Forwarded-For: and X-Real-IP: HTTP headers. For details, see Rewriting Requests on page 144. • URL • Host: • X-Forwarded-For:
Account Takeover	• Host: • Cookie: • Parameters in the URL • URL in HTTP header • HTTP body • Client's certificate
API Gateway	• Host: • URL in HTTP header • API Key as HTTP parameter in URL • API Key as HTTP header • Source IP address of the client depending on your configuration of API user • Request methods in HTTP header • HTTP Referer depending on your configuration of API user
OpenAPI Validation	• Host: • HTTP headers, especially the content-type: headers • URL in HTTP header

Scan/action	Involves
	• Request method in HTTP header • Parameters in URL • Multipart filename
URL Rewriting (rewriting & redirection)	• `Host:` • `Referer:` • `Location:` • URL in HTTP header • HTML body
Machine Learning - Anomaly Detection	• Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the `SRC` field in the IP header, or the `X-Forwarded-For:` and `X-Real-IP:` HTTP headers. For details, see "Defining your proxies, clients, & X-headers" on page 1. • URL in the HTTP header • Request method in HTTP header • Parameter in the URL, or the HTTP header or body • `Content-Type:`
Compression	`Accept-Encoding:`
Cookie Security	• Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the `SRC` field in the IP header, or the `X-Forwarded-For:` and `X-Real-IP:` HTTP headers. For details, see Request Limits on page 102 • `Cookie:`
Reply from server to client	
Web Socket Protocol	• `Upgrade:`
Caching	• `Host:` • HTTP method • Return code • URL in the HTTP header • `Content-Type:` • HTTP headers • Size in kilobytes (KB) of each URL to cache
Bot Deception	• `Host:` • URL in the HTTP header
Protection for Man-in-the-Browser (MiTB) attacks	• Status code • Response body
Biometrics Based Detection	• Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the `SRC` field in the IP header, or the `X-Forwarded-For:` and `X-Real-IP:` HTTP headers. For details, see Request Limits on page 102

Scan/action	Involves
	- URL - `Host:` - `X-Forwarded-For:` - HTTP header - Custom signature - Body - The latest HTTP transaction time - The response content type - Status code
Signature Based Detection (Information Leakage)	- Source IP address of the client depending on your configuration of X-header rules. This could be derived from either the `SRC` field in the IP header, or the `X-Forwarded-For:` and `X-Real-IP:` HTTP headers. For details, see Request Limits on page 102 - HTTP headers - HTML Body - URL in HTTP header - Parameters in URL and body - XML in the body of HTTP POST requests - Cookies - Headers - JSON Protocol Detection - Uploaded filename (MULTIPART_FORM_DATA_FILENAME)
Custom Rule	- HTTP response code - `Content-Type:`
Account Takeover	- Status code - HTTP headers - HTML body
URL Rewriting (rewriting)	- `Host:` - `Referer:` - `Location:` - URL in HTTP header - HTML body
HTTP Header Security	- HTTP headers

Supported cipher suites & protocol versions

A secure connection’s protocol version and cipher suite, including encryption bit strength and encryption algorithms, is negotiated between the client and the SSL/TLS terminator during the handshake.

The **SSL/TLS Encryption Level** controls how many ciphers are supported and the settings provides the following options:

- **Mozilla-Modern:** For services with clients that support TLS 1.3 and don't need backward compatibility, Mozilla-Modern is the recommended configuration as it provides an extremely high level of security.
- **Mozilla-Intermediate:** For services that don't need compatibility with legacy clients such as Windows XP or old versions of OpenSSL, Mozilla-Intermediate is the recommended configuration as it is highly secure and in the meanwhile compatible with nearly every client released in the last five (or more) years.
- **Mozilla-Old:** For services accessed by very old clients or libraries, such as Internet Explorer 8 (Windows XP), Java 6, or OpenSSL 0.9.8. Mozilla-old is the recommended configuration as it is compatible with most of the clients.
- **Customized** – Supports a customizable list of all ciphers.

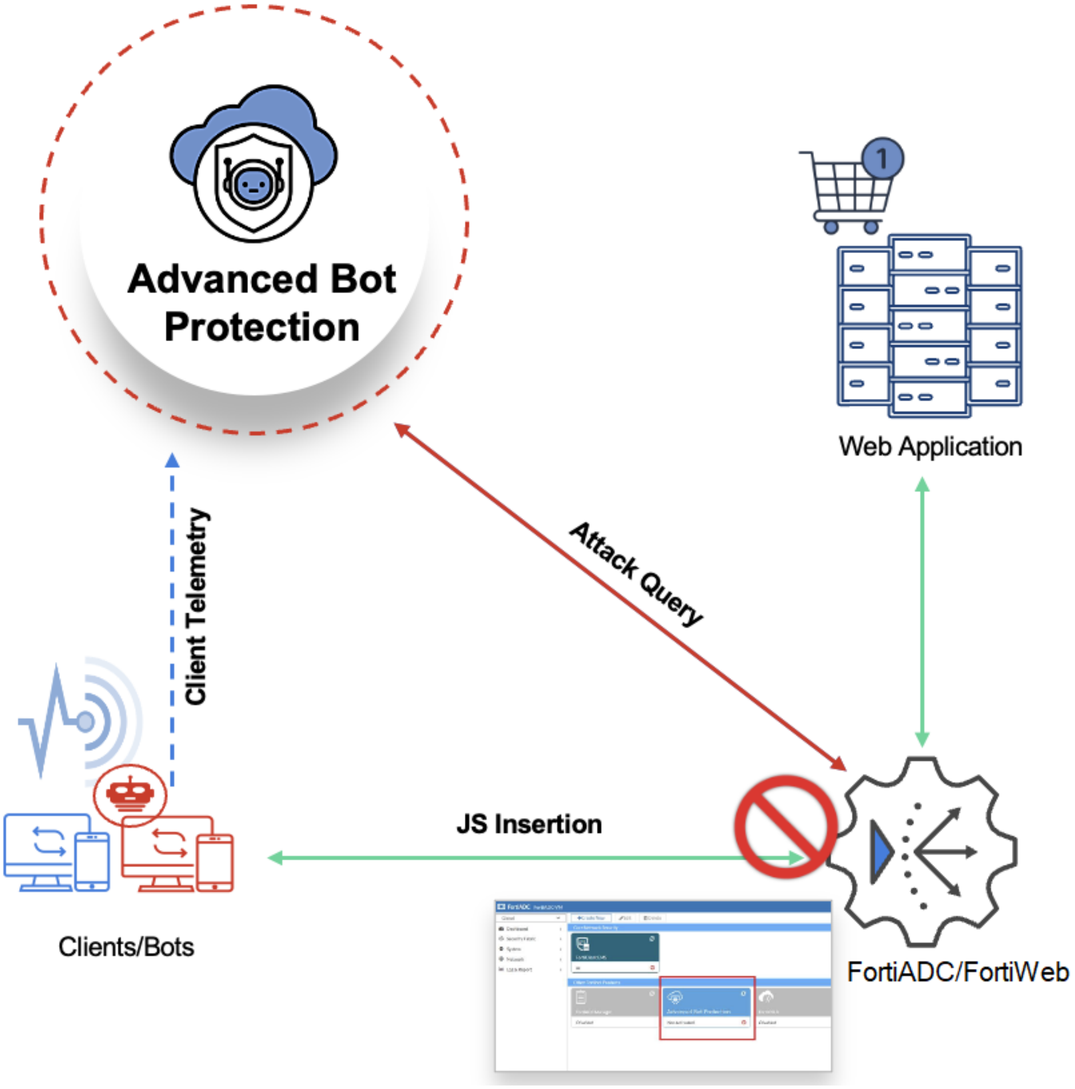
Ciphers supported by Mozilla-Modern/Intermediate/Old levels

Cipher	Mozilla Modern	Mozilla Intermediate	Mozilla Old
TLS_AES_256_GCM_SHA384	Yes	Yes	Yes
TLS_CHACHA20_POLY1305_SHA256	Yes	Yes	Yes
TLS_AES_128_GCM_SHA256	Yes	Yes	Yes
ECDHE-ECDSA-AES128-GCM-SHA256		Yes	Yes
ECDHE-RSA-AES128-GCM-SHA256		Yes	Yes
ECDHE-ECDSA-AES256-GCM-SHA384		Yes	Yes
ECDHE-RSA-AES256-GCM-SHA384		Yes	Yes
ECDHE-ECDSA-CHACHA20-POLY1305		Yes	Yes
ECDHE-RSA-CHACHA20-POLY1305		Yes	Yes
DHE-RSA-AES128-GCM-SHA256		Yes	Yes
DHE-RSA-AES256-GCM-SHA384		Yes	Yes
DHE-RSA-CHACHA20-POLY1305			Yes
ECDHE-ECDSA-AES128-SHA256			Yes
ECDHE-RSA-AES128-SHA256			Yes
ECDHE-ECDSA-AES128-SHA			Yes
ECDHE-RSA-AES128-SHA			Yes
ECDHE-ECDSA-AES256-SHA384			Yes

Cipher	Mozilla Modern	Mozilla Intermediate	Mozilla Old
ECDHE-RSA-AES256-SHA384			Yes
ECDHE-ECDSA-AES256-SHA			Yes
ECDHE-RSA-AES256-SHA			Yes
DHE-RSA-AES128-SHA256			Yes
DHE-RSA-AES256-SHA256			Yes
AES128-GCM-SHA256			Yes
AES256-GCM-SHA384			Yes
AES128-SHA256			Yes
AES256-SHA256			Yes
AES128-SHA			Yes
AES256-SHA			Yes
DES-CBC3-SHA			Yes

Advanced Bot Protection

FortiAppSec Cloud Advanced Bot Protection (ABP) is a Fortinet SaaS advanced bot mitigation solution designed to detect and protect against sophisticated bots that may be used to conduct malicious automated attacks on your online applications, such as data harvesting, credential stuffing, account take-over attempts, DDoS attacks, and other fraudulent activities. To safeguard your digital assets, websites, and applications, ABP employs advanced deep learning algorithms and behavior analysis to identify and block suspicious activities. It analyzes user behavior patterns, device fingerprints, and more to distinguish between genuine users and malicious bots.



FortiAppSec Cloud Advanced Bot Protection features a multidimensional deep learning engine that learns and tracks bot attacks over time using sophisticated AI model training. Here are some of the key ways that enable ABP to detect and stop malicious bots while allowing legitimate traffic through:

- **IP reputation database** — Maintains a real-time database of known or suspicious IP addresses associated with bots and blocks traffic from them.

- **Browser Fingerprinting** — Creates unique fingerprints for each visitor by cross-referencing various browser/device attributes to recognize repeat offenders. This includes detecting crawler-specific attributes, checking browser and OS inconsistencies.
- **Biometric detection** — Analyzes visitors' device interactions to determine if a user is a real human or a bot, as biometric signals are very difficult for bots to fake. This includes monitoring client events (over 250 characters), mouse movements (such as scrolling behavior and clicks), and keyboard clicks.
- **Machine learning models** — ABP uses AI to train models on vast datasets and continuously improve and refine bot detection capabilities.
- **Real-time threat intelligence (AI Score)** — Leverages global threat intelligence to stay on top of new and emerging bot threats and update protections. The AI Score is compiled through deep learning and data correlation, multi-dimensional comparison, and multivariate data over time.
- **Comprehensive analytics** — Provides detailed bot traffic analytics and attack forensics to enhance understanding of bot patterns and strategies.
- **Integration with FortiADC and FortiWeb** — Allows FortiADC and FortiWeb to send telemetry data to the bot protection system, providing deeper insights into sophisticated bots for more accurate detection and blocking.

The factors listed above collectively contribute to the calculation of the **Risk Score** — a numerical value ranging from 0 to 100 that reflects the likelihood of a user being a bot.

Overview

The following sections provide an overview of Advanced Bot Protection use cases and configurations.

- Security Fabric Integration on page 194
- ABP Workflow and Dashboard Overview on page 195

Security Fabric Integration

The FortiAppSec Cloud ABP system is designed to seamlessly integrate with your existing infrastructure, supporting various products in the Fortinet Security Fabric, including FortiADC and FortiWeb.

No.	Description
1	User request reaches FortiADC/FortiWeb (as Reverse Proxy).
2	FortiADC/FortiWeb inserts a JavaScript to the HTTP/S response for telemetric information.
3	The client and FortiADC/FortiWeb (via Fabric connector) share telemetry data (such as IP, headers, and device fingerprinting) with the Advanced Bot Protection engine.
4	Using Deep Learning, FortiAppSec Cloud ABP determines if the client is a human or a bot.
5	ABP sends instructions back to FortiADC/FortiWeb to initiate an action against the request (such as block, CAPTCHA, or allow).

Supported Fortinet Products for Integration:

- **FortiADC** — An advanced Application Delivery Controller (ADC) that provides Application availability using Server Load Balancing (in Layer 4 and Layer 7) and Global Server Load Balancing (GSLB), along with application Security features such as Web Application Firewall (WAF), IPS, DLP, Sandbox, AV and more. For integration instructions, please refer to FortiADC Integration on page 214

- **FortiWeb** — A web application firewall (WAF) that protects hosted web applications from attacks that target known and unknown exploits. Using multi-layered and correlated detection methods, FortiWeb defends applications from known vulnerabilities and zero-day threats. The Web Application Security Service from FortiGuard Labs uses information based on the latest application vulnerabilities, bots, suspicious URL and data patterns, and specialized heuristic detection engines to keep your applications safe. For integration instructions, please refer to FortiWeb Integration on page 220

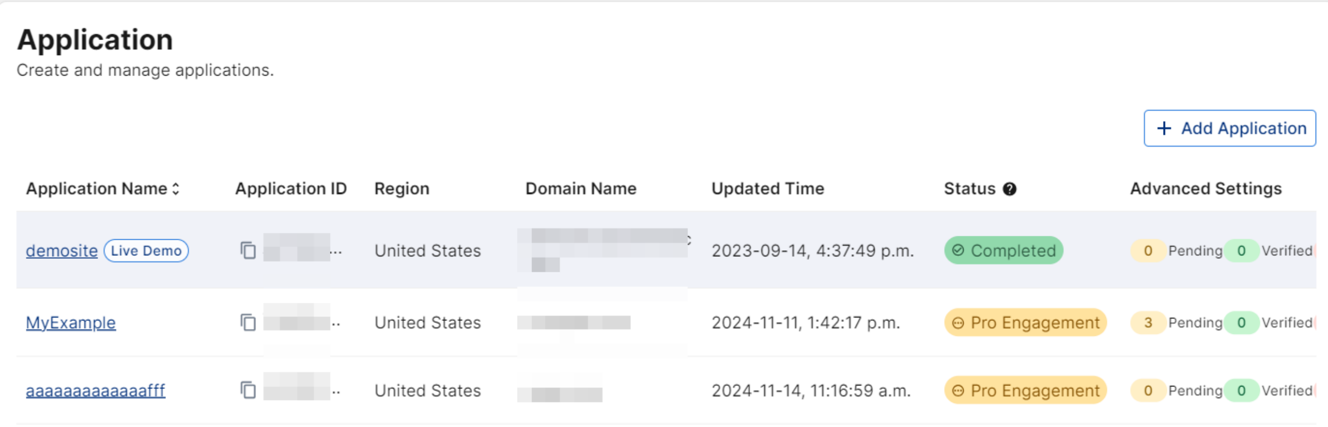
For information on how to link your ABP service with the WAF service within FortiAppSec Cloud, please refer to Integrating Advanced Bot Protection into the Fortinet Security Fabric on page 213

ABP Workflow and Dashboard Overview

This section provides an introduction to the primary web portal pages for configuring settings and monitoring application activity in FortiAppSec Cloud's ABP Service.

Application

The **Application** page contains the management settings for the applications you want to protect through FortiAppSec Cloud. Here, you can add new applications and access the details on existing applications, most notably the **Application ID** and **Status** information. When you initially add an application, the status will be **pending** until it has been fully analyzed and Pre-Provisioning is complete. Once the application status is **ready**, you can connect ABP to your connector device using the Application ID.



Application

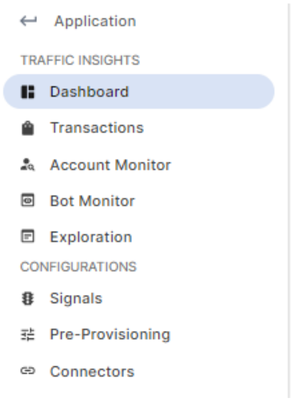
Create and manage applications.

Application Name ⇕	Application ID	Region	Domain Name	Updated Time	Status ❓	Advanced Settings
demosite Live Demo	[redacted]	United States	[redacted]	2023-09-14, 4:37:49 p.m.	Completed	0 Pending 0 Verified
MyExample	[redacted]	United States	[redacted]	2024-11-11, 1:42:17 p.m.	Pro Engagement	3 Pending 0 Verified
aaaaaaaaaaaaafff	[redacted]	United States	[redacted]	2024-11-14, 11:16:59 a.m.	Pro Engagement	0 Pending 0 Verified

Traffic Insights

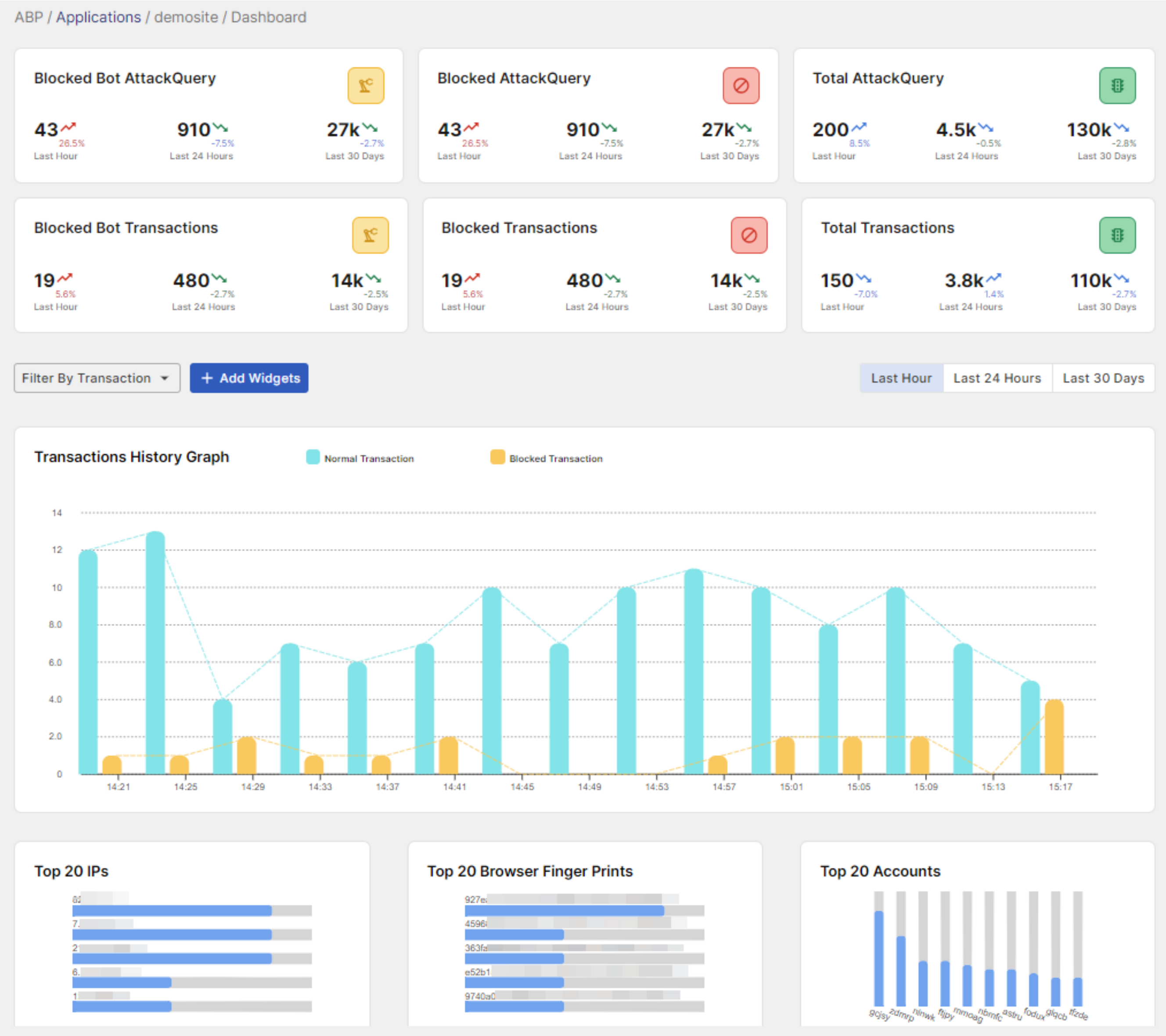
The **Traffic Insights** menu includes dashboards and monitors to view real-time reporting and analytics of your traffic, bot activity, and security incidents to provide insights to help you make informed decisions to enhance your bot protection strategy.

To access the **Traffic Insights** and **Configurations** pages, click the name of one of the applications on the **Application** page.



Dashboard

The **Dashboard** page contains widgets and graphs that provide data visualizations of the various data points collected and monitored in FortiAppSec Cloud.



ABP / Applications / demosite / Dashboard

Blocked Bot AttackQuery

43 26.5% Last Hour | 910 -7.5% Last 24 Hours | 27k -2.7% Last 30 Days

Blocked AttackQuery

43 26.5% Last Hour | 910 -7.5% Last 24 Hours | 27k -2.7% Last 30 Days

Total AttackQuery

200 8.5% Last Hour | 4.5k -0.5% Last 24 Hours | 130k -2.8% Last 30 Days

Blocked Bot Transactions

19 5.6% Last Hour | 480 -2.7% Last 24 Hours | 14k -2.5% Last 30 Days

Blocked Transactions

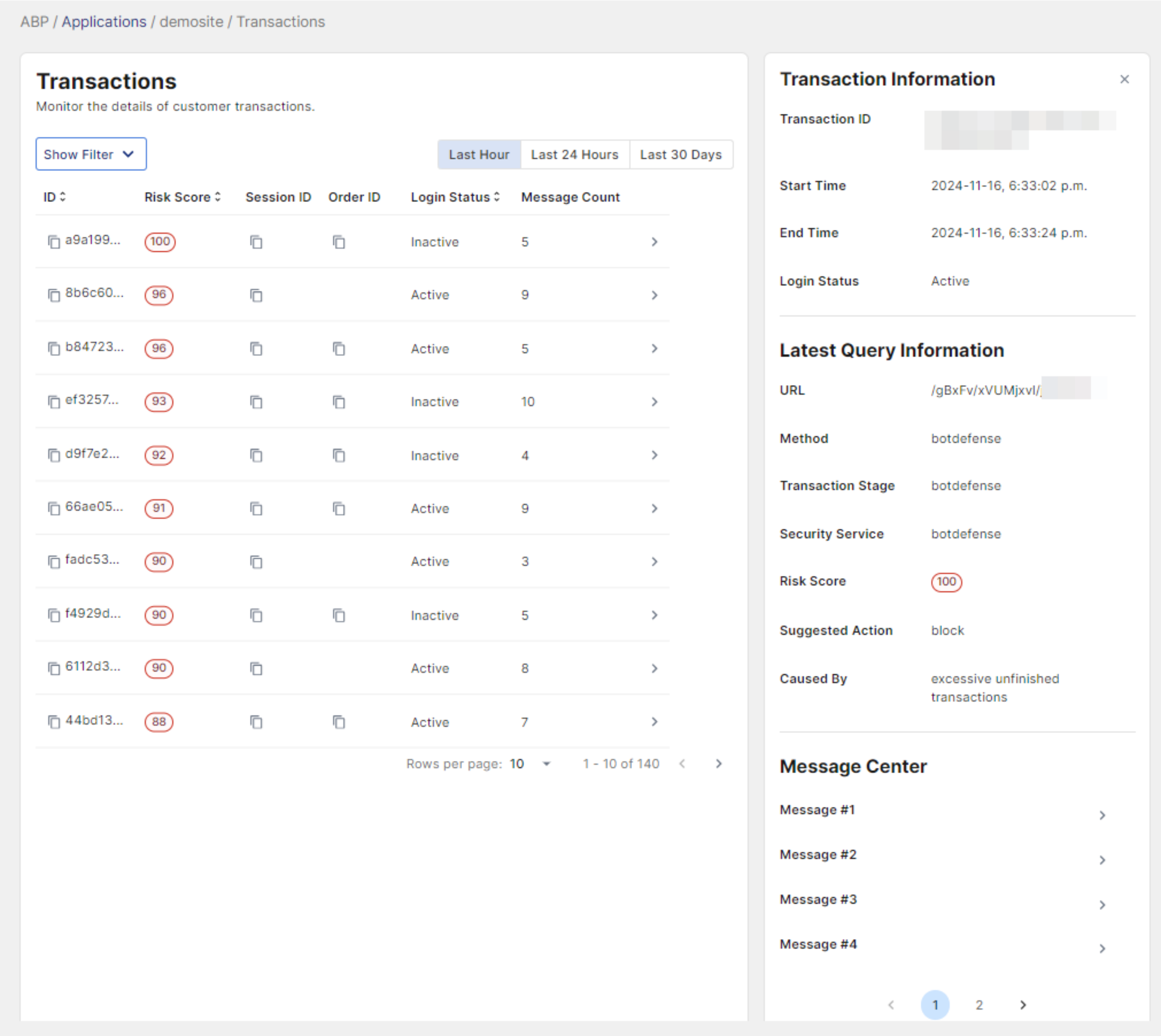
19 5.6% Last Hour | 480 -2.7% Last 24 Hours | 14k -2.5% Last 30 Days

Total Transactions

150 -7.0% Last Hour | 3.8k 1.4% Last 24 Hours | 110k -2.7% Last 30 Days

Transactions

The **Transactions** page contains the records of all user activities within your application, including login attempts, payment outcomes, idle periods exceeding a specified duration, and browser closure. You have the option to view records from the last hour, last 24 hours, or last 30 days.



ABP / Applications / demosite / Transactions

ID	Risk Score	Session ID	Order ID	Login Status	Message Count
a9a199...	100	⧉	⧉	Inactive	5
8b6c60...	96	⧉		Active	9
b84723...	96	⧉	⧉	Active	5
ef3257...	93	⧉	⧉	Inactive	10
d9f7e2...	92	⧉	⧉	Inactive	4
66ae05...	91	⧉	⧉	Active	9
fadc53...	90	⧉		Active	3
f4929d...	90	⧉	⧉	Inactive	5
6112d3...	90	⧉		Active	8
44bd13...	88	⧉	⧉	Active	7

Rows per page: 10 1 - 10 of 140

Transaction Information

Transaction ID: [redacted]

Start Time: 2024-11-16, 6:33:02 p.m.

End Time: 2024-11-16, 6:33:24 p.m.

Login Status: Active

Latest Query Information

URL: /gBxFv/xVUMjxvl/[redacted]

Method: botdefense

Transaction Stage: botdefense

Security Service: botdefense

Risk Score: 100

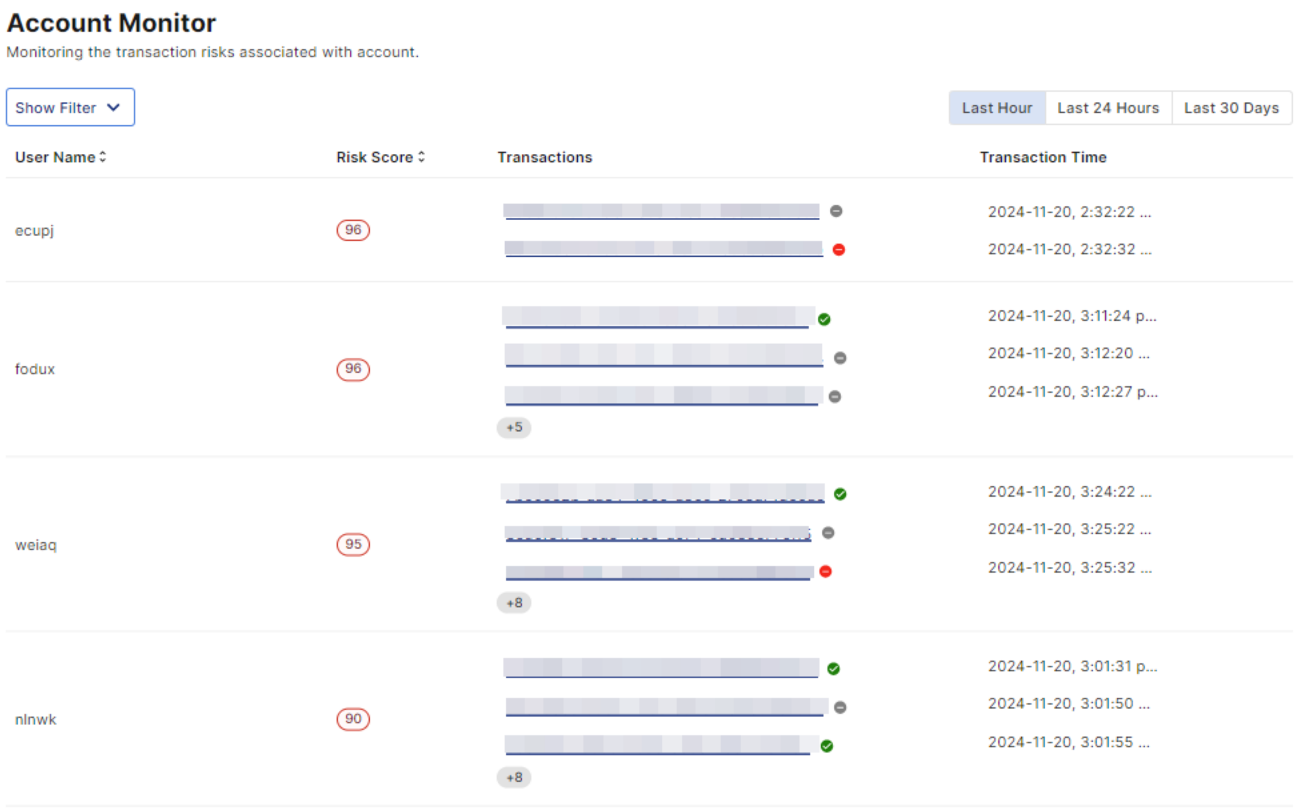
Suggested Action: block

Caused By: excessive unfinished transactions

Message Center

Account Monitor

From the **Account Monitor** page, you can monitor the transaction records based on the user to track the risk associated with each account over time.



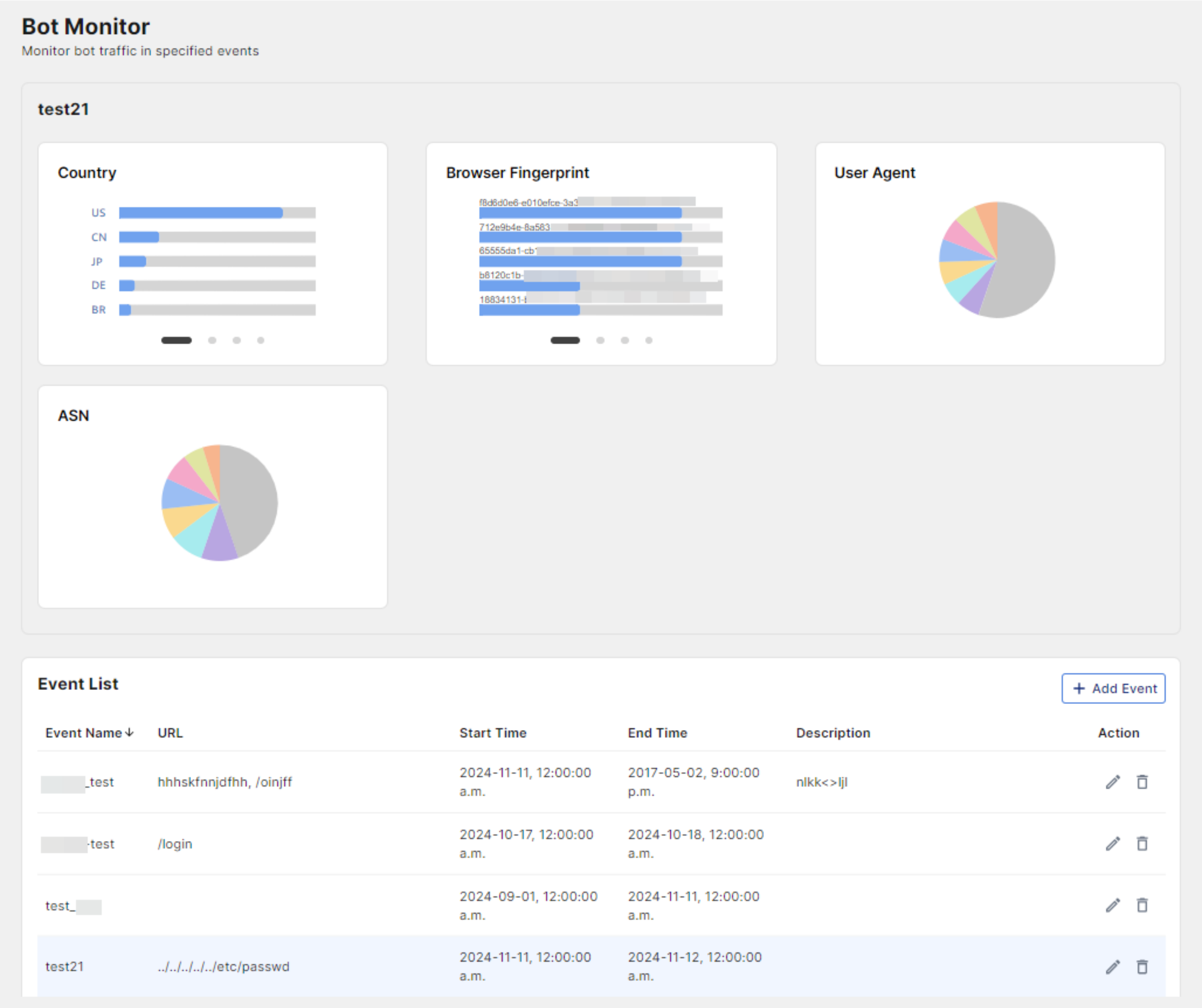
Account Monitor

Monitoring the transaction risks associated with account.

User Name ⇕	Risk Score ⇕	Transactions	Transaction Time
ecupj	96	[redacted] ⊖ [redacted] ⛔	2024-11-20, 2:32:22 ... 2024-11-20, 2:32:32 ...
fodux	96	[redacted] ✓ [redacted] ⊖ [redacted] ⊖ +5	2024-11-20, 3:11:24 p... 2024-11-20, 3:12:20 ... 2024-11-20, 3:12:27 p...
weiaq	95	[redacted] ✓ [redacted] ⊖ [redacted] ⛔ +8	2024-11-20, 3:24:22 ... 2024-11-20, 3:25:22 ... 2024-11-20, 3:25:32 ...
nlnwk	90	[redacted] ✓ [redacted] ⊖ [redacted] ✓ +8	2024-11-20, 3:01:31 p... 2024-11-20, 3:01:50 ... 2024-11-20, 3:01:55 ...

Bot Monitor

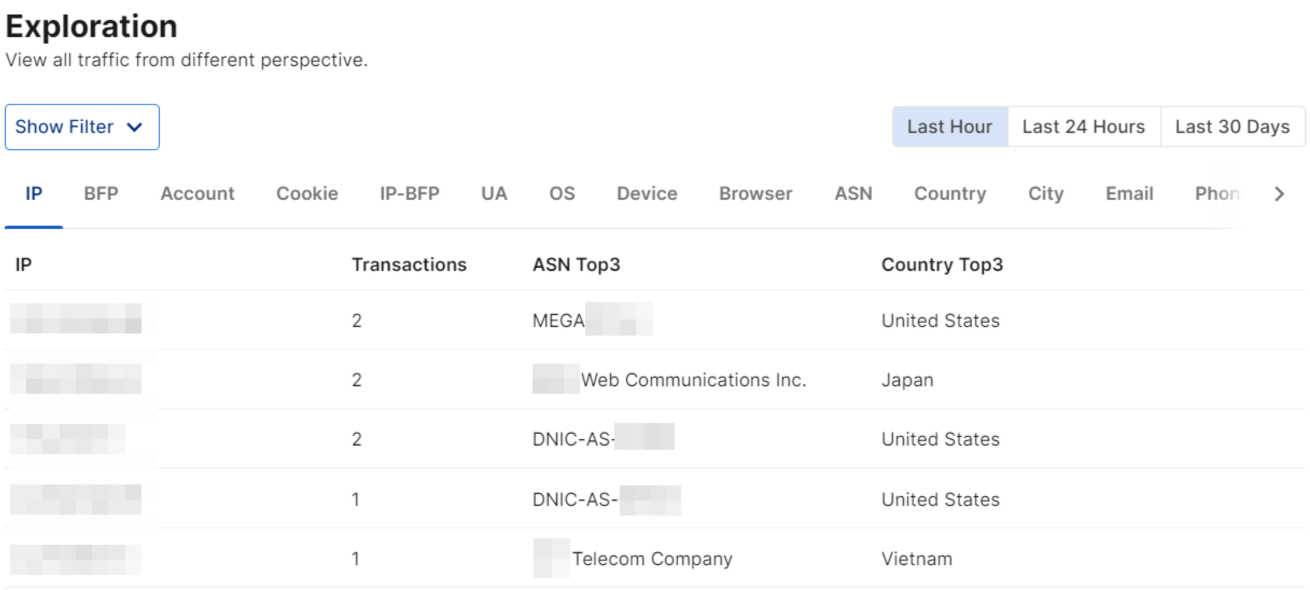
The **Bot Monitor** page allows you to define specified periods as bot monitoring events. This allows you to take snippets of bot traffic and analyze various data points such as the attack origin country, browser fingerprint, the cause of the bot attack, and more.



Event Name ↓	URL	Start Time	End Time	Description	Action
[redacted]_test	hhhskfnnjdfhh, /oinjff	2024-11-11, 12:00:00 a.m.	2017-05-02, 9:00:00 p.m.	nlkk<>ljl	✎ 🗑
[redacted]-test	/login	2024-10-17, 12:00:00 a.m.	2024-10-18, 12:00:00 a.m.		✎ 🗑
test_[redacted]		2024-09-01, 12:00:00 a.m.	2024-11-11, 12:00:00 a.m.		✎ 🗑
test21	../../../../../etc/passwd	2024-11-11, 12:00:00 a.m.	2024-11-12, 12:00:00 a.m.		✎ 🗑

Exploration

The Exploration page allows you to view all traffic information filtered through different data points to provide varied perspective and insight.



Exploration

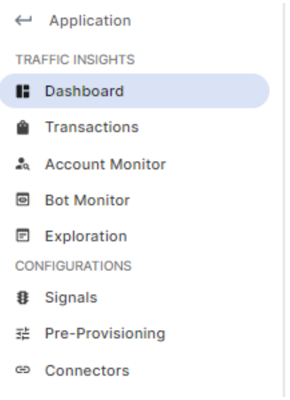
View all traffic from different perspective.

IP	Transactions	ASN Top3	Country Top3
[redacted]	2	MEGA[redacted]	United States
[redacted]	2	[redacted] Web Communications Inc.	Japan
[redacted]	2	DNIC-AS-[redacted]	United States
[redacted]	1	DNIC-AS-[redacted]	United States
[redacted]	1	[redacted] Telecom Company	Vietnam

Configurations

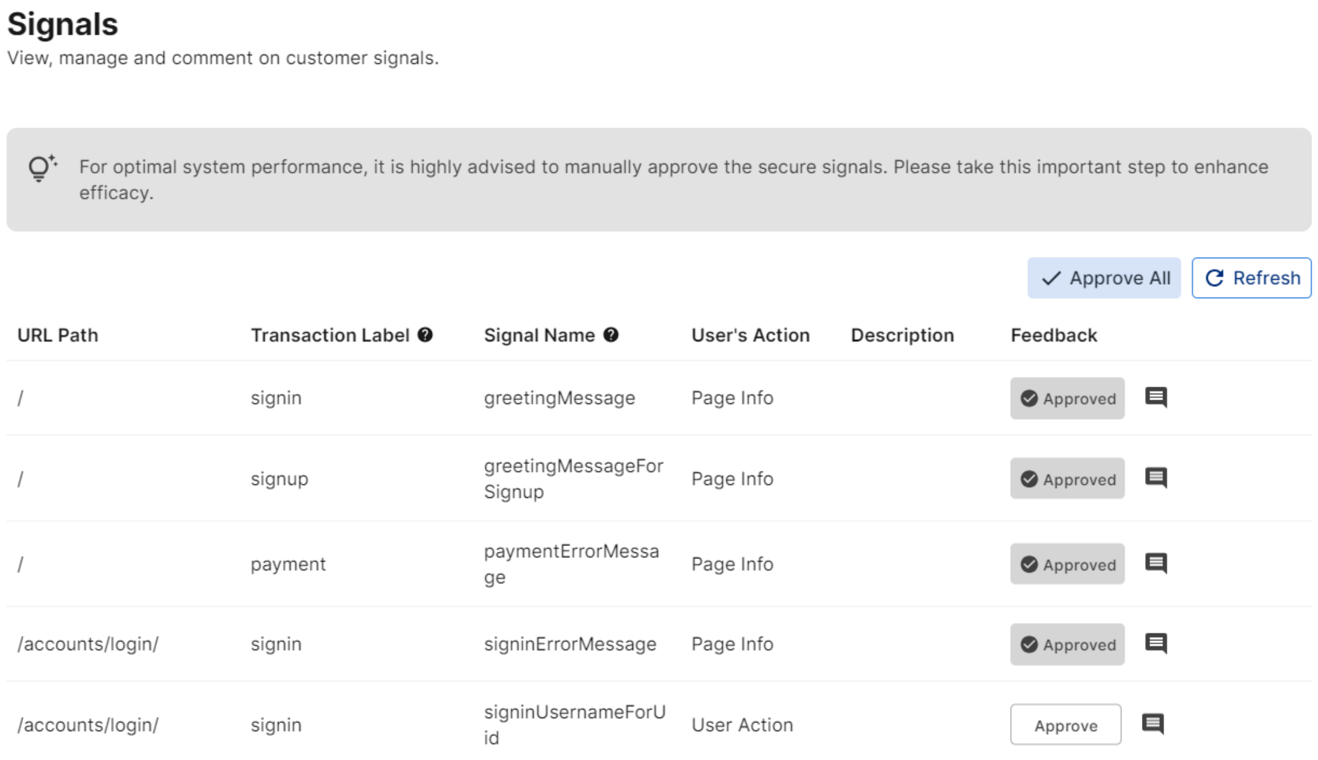
The **Configurations** menu contains the elements for setting up and customizing the Advanced Bot protection system.

To access the **Traffic Insights** and **Configurations** pages, click the name of one of the applications on the **Application** page.



Signals

The **Signals** page contain "Signal" entries, transactions which involve sensitive data that are identified as potential bot signifiers to incorporate into the ABP machine learning model. User approval is required to track the sensitive data contained in these Signals, otherwise ABP will exclude these data points in its AI model training to identify similar suspicious activity.



Signals

View, manage and comment on customer signals.

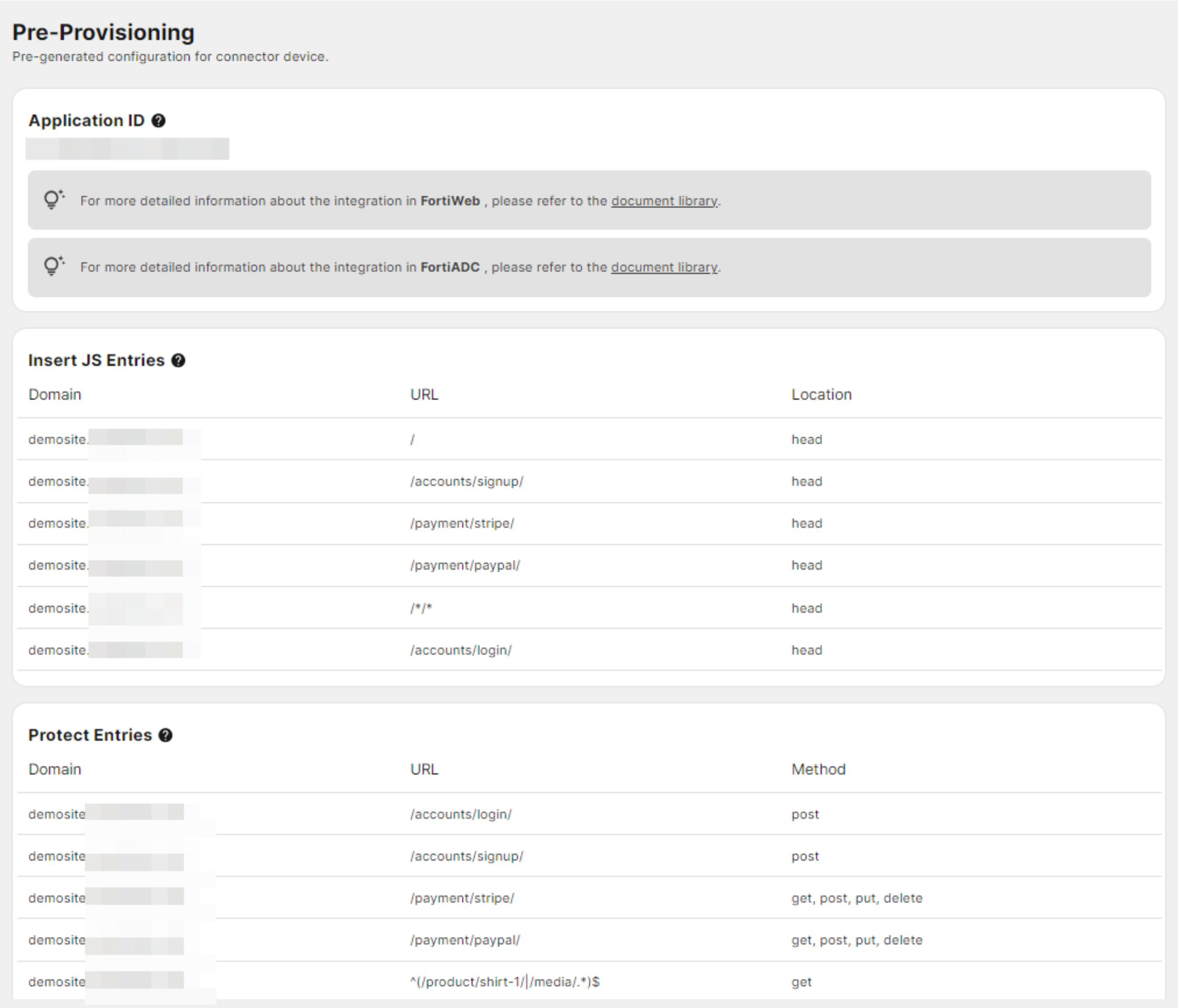
For optimal system performance, it is highly advised to manually approve the secure signals. Please take this important step to enhance efficacy.

URL Path	Transaction Label	Signal Name	User's Action	Description	Feedback
/	signin	greetingMessage	Page Info		Approved
/	signup	greetingMessageForSignup	Page Info		Approved
/	payment	paymentErrorMessage	Page Info		Approved
/accounts/login/	signin	signinErrorMessage	Page Info		Approved
/accounts/login/	signin	signinUsernameForUid	User Action		Approve

Pre-Provisioning

The **Pre-Provisioning** page contains the analyzed resources required to protect your application, which includes the protected URL entries and the locations where JavaScript is inserted through your connector devices to collect client information for bot detection.

The Pre-Provisioning process begins once you have added an Application. This triggers a request to the Professional Engagement Team (PET) to analyze your application details and to identify URLs to protect and insert the required JavaScript to enable the Advanced Bot Protection functionality. This process is currently conducted internally by the PET and requires 2 to 3 days to complete. If you wish to modify or add entries, please submit a request with Fortinet Support.



Pre-Provisioning

Pre-generated configuration for connector device.

Application ID

[redacted]

For more detailed information about the integration in **FortiWeb** , please refer to the document library.

For more detailed information about the integration in **FortiADC** , please refer to the document library.

Insert JS Entries

Domain	URL	Location
demosite.[redacted]	/	head
demosite.[redacted]	/accounts/signup/	head
demosite.[redacted]	/payment/stripe/	head
demosite.[redacted]	/payment/paypal/	head
demosite.[redacted]	/*/*	head
demosite.[redacted]	/accounts/login/	head

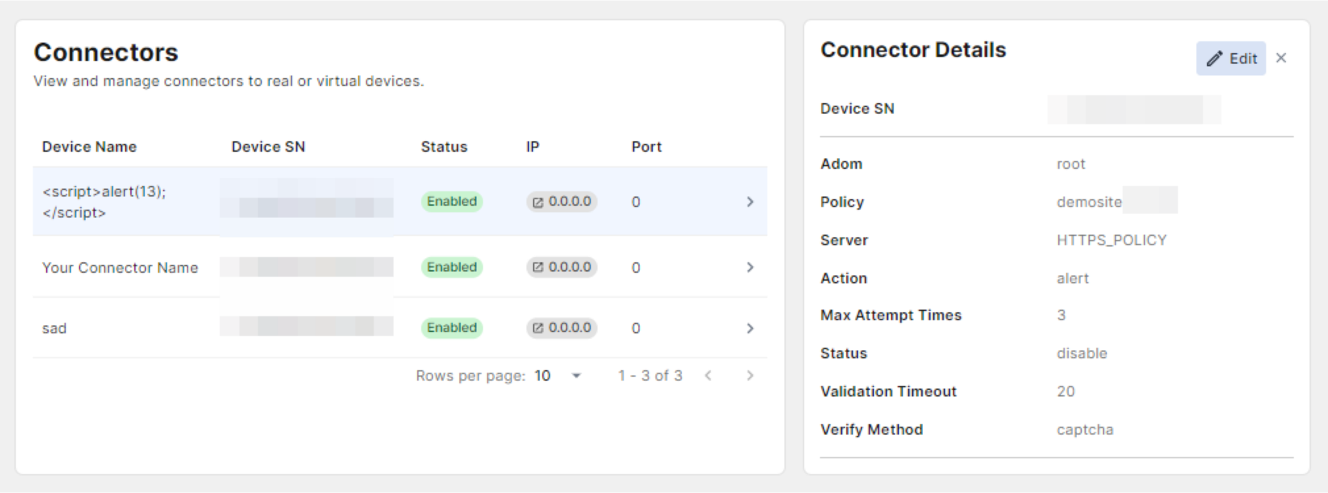
Protect Entries

Domain	URL	Method
demosite[redacted]	/accounts/login/	post
demosite[redacted]	/accounts/signup/	post
demosite[redacted]	/payment/stripe/	get, post, put, delete
demosite[redacted]	/payment/paypal/	get, post, put, delete
demosite[redacted]	^(/product/shirt-1/|/media/.*)$	get

Connectors

From the **Connectors** page, you can view the Fabric devices connected to ABP. This page contains details of each connector device, including their device serial number, IP address, port number, and more.

In rare troubleshooting scenarios when ABP does not successfully fetch the device IP or Port, you may edit these fields.



Connectors

View and manage connectors to real or virtual devices.

Device Name	Device SN	Status	IP	Port	
<script>alert(13); </script>	[redacted]	Enabled	0.0.0.0	0	›
Your Connector Name	[redacted]	Enabled	0.0.0.0	0	›
sad	[redacted]	Enabled	0.0.0.0	0	›

Rows per page: 10 1 - 3 of 3

Connector Details

Device SN	[redacted]
Adom	root
Policy	demosite[redacted]
Server	HTTPS_POLICY
Action	alert
Max Attempt Times	3
Status	disable
Validation Timeout	20
Verify Method	captcha

Onboarding an ABP Application

This section details the basic steps to onboard your FortiAppSec Cloud system.

Enabling **Advanced Bot Protection** on WAF will automatically generate a corresponding application on ABP if one has not been previously created for the application.

Therefore, if you intend to onboard your application to both ABP and WAF, we recommend first onboarding your application on WAF, then following the steps under Advanced Bot Protection on page 120.

Please note that only phases 1 and 3 require your involvement; phase 2 is conducted entirely internally.

1. Creating an ABP Application on page 204 — specifies an online application to apply advanced bot protection.
2. Pre-Provisioning Application resources on page 210 — the specified online application is analyzed to identify the URLs to protect and JavaScript insertion locations.
3. Integrating Advanced Bot Protection into the Fortinet Security Fabric on page 213 — deploys FortiAppSec Cloud for use with application traffic.

Creating an ABP Application

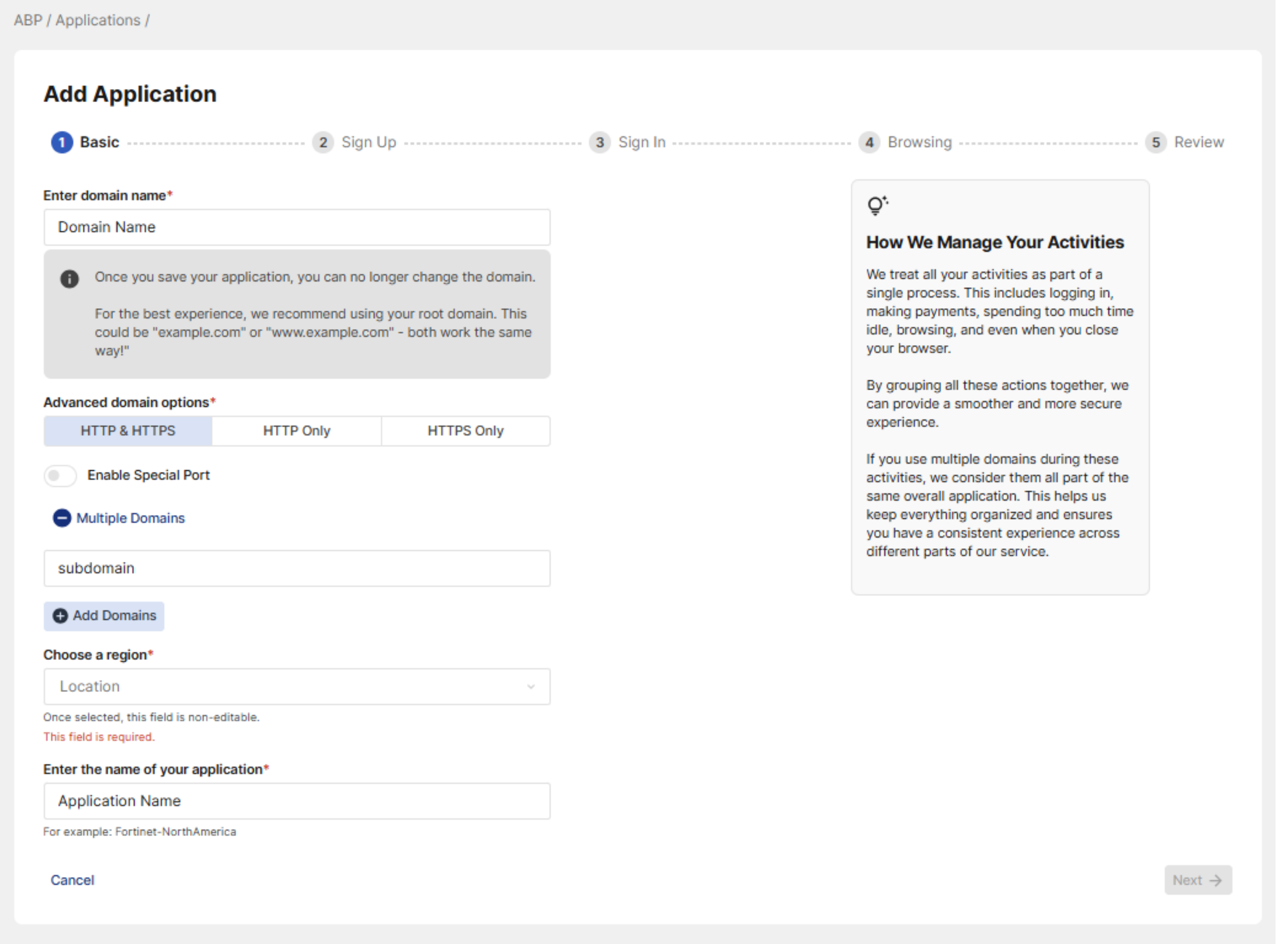
Specify an online application you want to apply FortiAppSec Cloud ABP services to. When you create an application, an **Application ID** will automatically be assigned to your application which can then be used to bind it to the Advanced Bot Protection policy in a connector device.

To create an ABP Application

Enabling **Advanced Bot Protection** on WAF will automatically generate a corresponding application on ABP if one has not been previously created for the application.

Therefore, if you intend to use onboard your application to both ABP and WAF, we recommend first onboarding your application on WAF, then following the steps under Advanced Bot Protection on page 120.

1. Navigate to **ABP > Application**.
2. Click **Create New**. This opens the **Create Application** wizard.
3. **Basic Information**



ABP / Applications /

Add Application

Enter domain name*

Domain Name

Once you save your application, you can no longer change the domain.

For the best experience, we recommend using your root domain. This could be "example.com" or "www.example.com" - both work the same way!"

Advanced domain options*

HTTP & HTTPS | HTTP Only | HTTPS Only

Enable Special Port

Multiple Domains

subdomain

Add Domains

Choose a region*

Location

Once selected, this field is non-editable.

This field is required.

Enter the name of your application*

Application Name

For example: Fortinet-NorthAmerica

How We Manage Your Activities

We treat all your activities as part of a single process. This includes logging in, making payments, spending too much time idle, browsing, and even when you close your browser.

By grouping all these actions together, we can provide a smoother and more secure experience.

If you use multiple domains during these activities, we consider them all part of the same overall application. This helps us keep everything organized and ensures you have a consistent experience across different parts of our service.

Enter the following mandatory fields:

Field	Description	Example Input
Domain Name	The domain name of your application. This field does not support wildcard, and cannot be edited.	www.fortinet.com

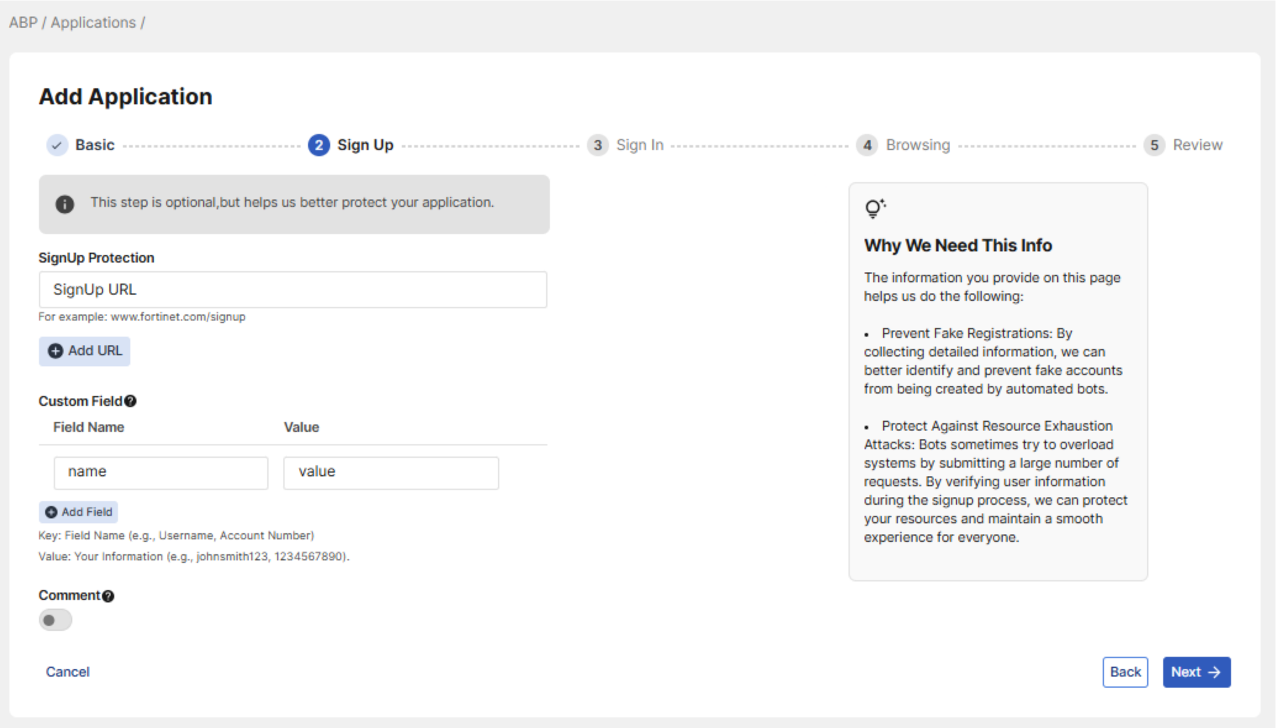
Field	Description	Example Input
Advanced domain options	Select the ports used by your application. If you restrict traffic to only HTTP or HTTPS, you can **Enable Special Port** if you are not using the default ports (80 for HTTP or 443 for HTTPS).	
Multiple Domains	Enter up to 10 subdomains of your application to ensure comprehensive protection	store.fortinet.com
Region	The location of the FortiAppSec Cloud ABP service that processes the traffic of your application.	US
Application Name	The internal name by which this application is displayed within your FortiAppSec Cloud ABP.	Fortinet-NA

4. **Sign Up**

While **Sign Up** URLs are automatically detected during pre-provisioning, manually entering additional information about your application pages helps us do the following:

- Prevent Fake Registrations: By collecting detailed information, we can better identify and prevent fake accounts from being created by automated bots.
- Protect Against Resource Exhaustion Attacks: Bots sometimes try to overload systems by submitting a large number of requests. By verifying user information during the signup process, we can protect your resources and maintain a smooth experience for everyone.

For details, see Pre-Provisioning Application resources on page 210.



ABP / Applications /

Add Application

This step is optional,but helps us better protect your application.

SignUp Protection

SignUp URL

For example: www.fortinet.com/signup

Custom Field

Field Name	Value
name	value

Key: Field Name (e.g., Username, Account Number)

Value: Your Information (e.g., johnsmith123, 1234567890).

Comment

Why We Need This Info

The information you provide on this page helps us do the following:

- Prevent Fake Registrations: By collecting detailed information, we can better identify and prevent fake accounts from being created by automated bots.
- Protect Against Resource Exhaustion Attacks: Bots sometimes try to overload systems by submitting a large number of requests. By verifying user information during the signup process, we can protect your resources and maintain a smooth experience for everyone.

Enter the following:

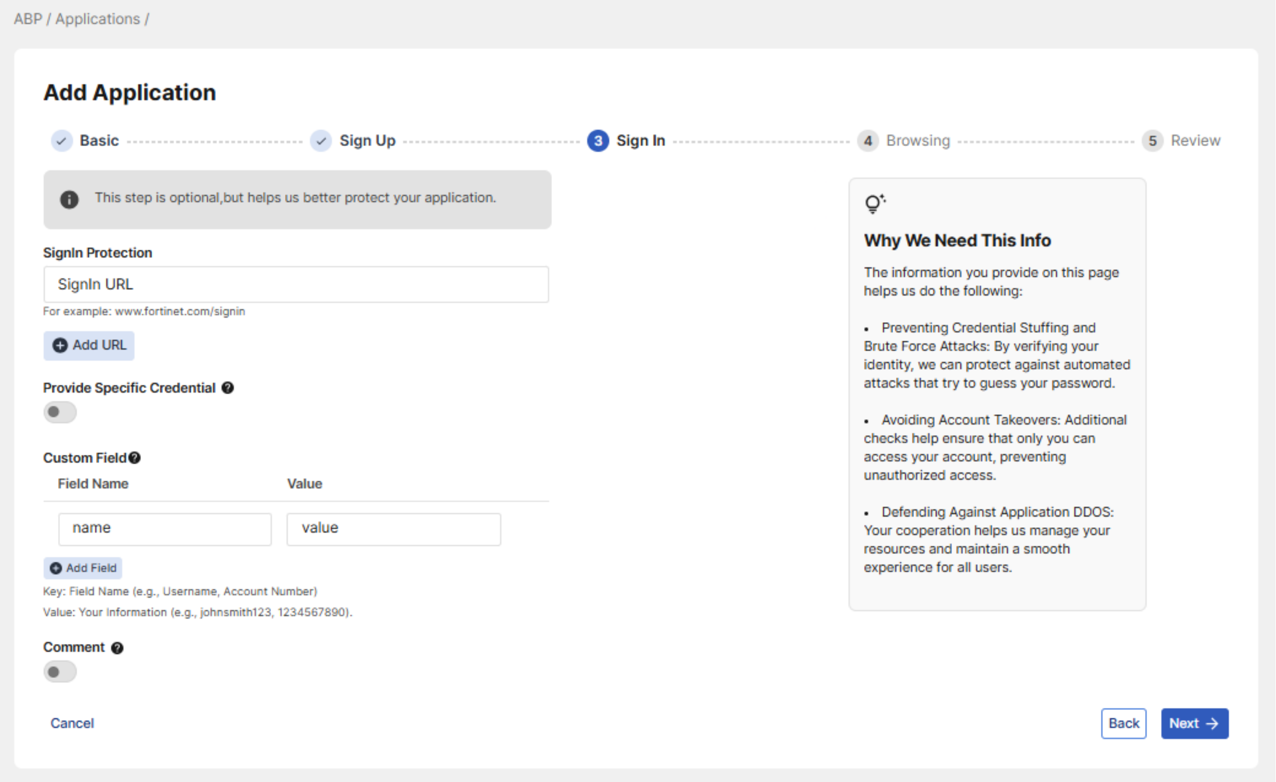
Field	Description	Example Input
SignUp Protection	Enter your application's sign up URL(s). If you have multiple signup pages, click **Add URL** to add additional input fields.	http://www.fortinet.com/register
Custom Field	Optional: Enable this option to specify input fields that contain user verification values beyond sign-in or sign-up credentials, and provide a test input value. For **Value**, enter a valid test value that will direct us to the pages accessed by a user. This helps us analyze more user-accessed pages without impacting your actual user data.	**Field name**:phone number **Value**: 1234567890
Comment	Optional: Use this space to give us any additional information on your application you would like us to know.	

5. **Sign In**

While **Sign In** URLs are automatically detected during pre-provisioning, manually entering additional information about your application pages helps us do the following:

- Preventing Credential Stuffing and Brute Force Attacks: By verifying user identities, we can protect against automated attacks that attempt to guess passwords.
- Avoiding Account Takeovers: Additional checks ensure that only the account owner can access the account, preventing unauthorized access.
- Defending Against Application DDOS: Your cooperation helps us manage your resources and maintain a smooth experience for all users.

For details, see Pre-Provisioning Application resources on page 210.



ABP / Applications /

Add Application

✓ Basic — ✓ Sign Up — 3 Sign In — 4 Browsing — 5 Review

This step is optional,but helps us better protect your application.

SignIn Protection

SignIn URL

For example: www.fortinet.com/signin

Add URL

Provide Specific Credential

Custom Field

Field Name	Value
name	value

Add Field

Key: Field Name (e.g., Username, Account Number)

Value: Your Information (e.g., johnsmith123, 1234567890).

Comment

Cancel

Back

Next →

Why We Need This Info

The information you provide on this page helps us do the following:

- Preventing Credential Stuffing and Brute Force Attacks: By verifying your identity, we can protect against automated attacks that try to guess your password.
- Avoiding Account Takeovers: Additional checks help ensure that only you can access your account, preventing unauthorized access.
- Defending Against Application DDOS: Your cooperation helps us manage your resources and maintain a smooth experience for all users.

Enter the following:

Field	Description	Example Input
Sign In Protection	Enter your application's sign in URL. If you have multiple login pages, use the plus sign (+) to add additional input fields.	http://www.fortinet.com/login
Provide Specific Credential	Optional: Enable this if you'd like to provide test account credentials for logging into your application. This allows us to analyze additional user-accessed pages without impacting your user data.	**Username**: test_account_1 **Password**: MySecurePass!2024

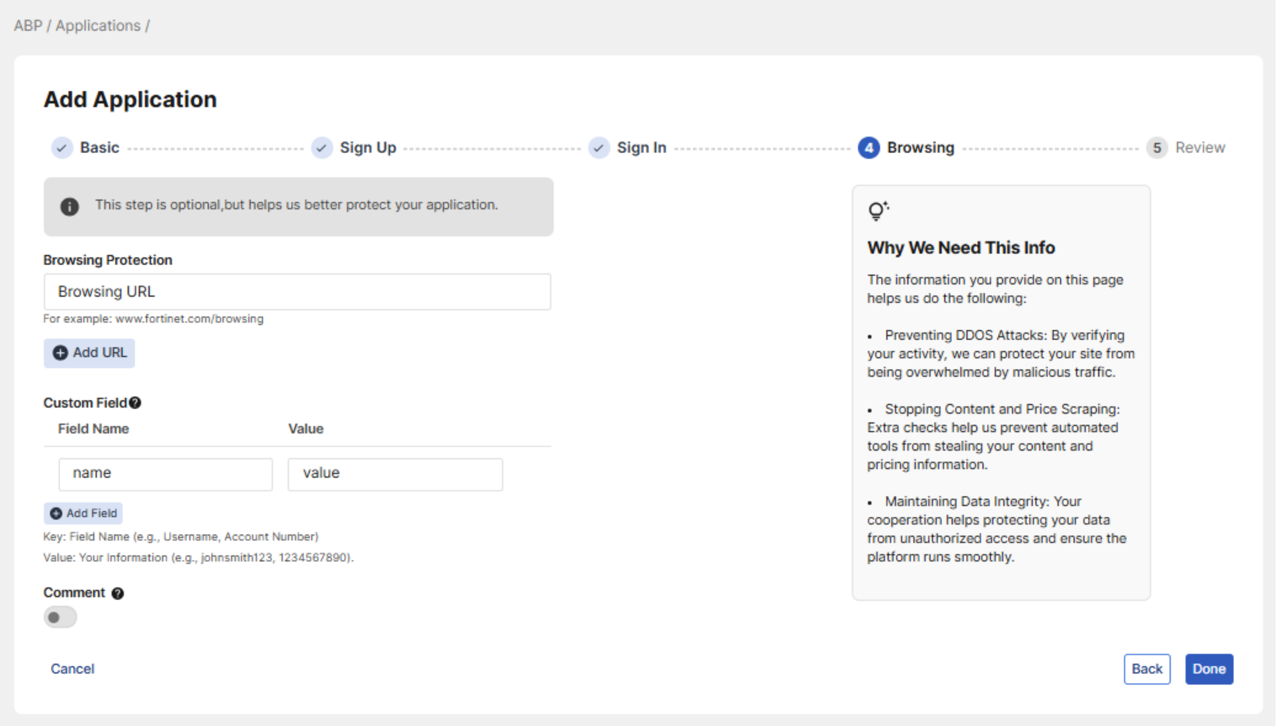
Field	Description	Example Input
Custom Field	Optional: Enable this option to specify input fields that may contain verification values for users other than sign-in credentials. For **Value**, enter a valid test value that will direct us to the pages accessed by a user. This helps us analyze more user-accessed pages without impacting your actual user data.	**Field name**: phone number **Value**: 01234567890
Comment	Optional: Use this space to give us any additional information on your application you would like us to know.	

6. **Browsing Protection**

While **Browsing Protection** URLs are automatically detected during pre-provisioning, manually entering additional information about your application pages helps us do the following:

- **Preventing DDOS Attacks:** By verifying your activity, we can protect your site from being overwhelmed by malicious traffic.
- **Stopping Content and Price Scraping:** Extra checks help us prevent automated tools from stealing your content and pricing information.
- **Maintaining Data Integrity:** Your cooperation helps protect your data from unauthorized access and ensures the platform runs smoothly.

For details, see Pre-Provisioning Application resources on page 210.



This step is optional,but helps us better protect your application.

For example: www.fortinet.com/browsing

Key: Field Name (e.g., Username, Account Number)

Value: Your Information (e.g., johnsmith123, 1234567890).

Why We Need This Info

The information you provide on this page helps us do the following:

- Preventing DDOS Attacks: By verifying your activity, we can protect your site from being overwhelmed by malicious traffic.
- Stopping Content and Price Scraping: Extra checks help us prevent automated tools from stealing your content and pricing information.
- Maintaining Data Integrity: Your cooperation helps protecting your data from unauthorized access and ensure the platform runs smoothly.

Browsing Protection	Enter URLs for pages that enable user browsing, such as those featuring product categories, online directories, or content exploration feeds. If you have multiple signup pages, click **Add URL** to add additional input fields.	http://www.fortinet.com/products
Custom Field	Optional: Enable this option to specify browsing-related input fields that contain verification values. For **Value**, enter a valid test value that will direct us to the pages accessed by a user. This helps us analyze more user-accessed pages without impacting your actual user data.	**Field name**: tracking number **Value**: 9876543210
Comment	Optional: Use this space to give us any additional information on your application you would like us to know.	

7. **Review information and submit**

   Please ensure all application information is correct before submitting. Note that once submitted, the domain name cannot be edited.

For more information on how to edit and delete applications, please see ABP Application on page 223.

When your URL is verified and the status changes to **Ready**, this means your application is now being protected by FortiAppSec Cloud. You can now navigate to **CONFIGURATIONS > Pre-Provisioning** to see where scripts have been inserted into your application for gathering user behavior. For more information on this process, please see Pre-Provisioning Application resources on page 210.

Please note that manually entering URL entries through FortiAppSec Cloud is not supported. If you wish to protect additional URLs, visit the Support site (https://support.fortinet.com) and submit a ticket.

If you are using ABP in tandem with FortiWeb or FortiADC, please see Integrating Advanced Bot Protection into the Fortinet Security Fabric on page 213 for additional information.

Pre-Provisioning Application resources

Once a ABP Application is created, the Pre-Provisioning process begins, prompting the Professional Engagement Team (PET) to analyze your application details, identify URLs for protection, and insert the required JavaScript for Advanced Bot Protection. While no action is needed from your end, if you wish to modify or add entries, please submit a request with Fortinet Support.

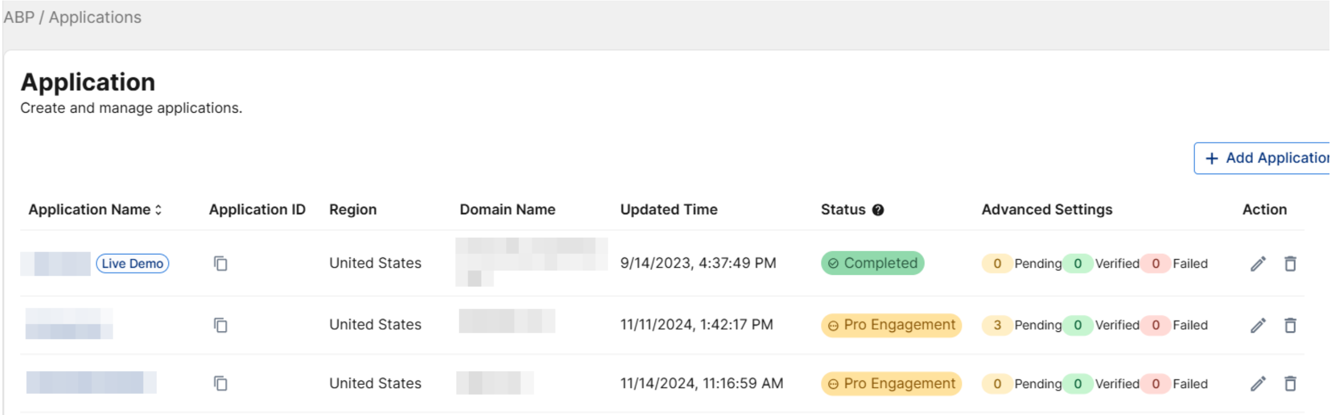
There is no need to wait until the pre-provisioning process is complete to continue onboarding ABP. After you have created the ABP Application, you can begin configuring the ABP integration in the Fortinet Fabric device (such as FortiADC and FortiWeb). However, the Advanced Bot Protection functionality will not activate until your ABP Application is fully analyzed and Pre-Provisioned. For information on the next steps, see Integrating Advanced Bot Protection into the Fortinet Security Fabric on page 213.

The three stages of pre-provisioning are the following:

- Professional Engagement on page 212
- Data Collection and Training on page 213
- Rules Deployment on page 213

For information on pre-provisioning configurations, including features on the **Configurations > Pre-Provisioning** page in the web portal GUI, please refer to Pre-Provisioning on page 243.

You can find the pre-provisioning status of all of your applications on **ABP > Application** under **Status** and **Advanced Settings**.



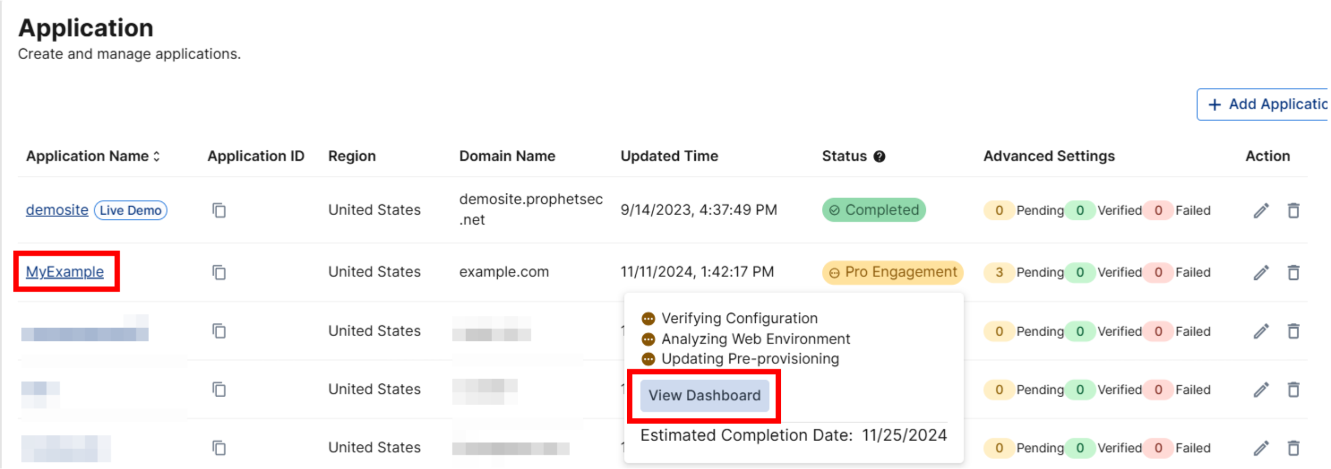
ABP / Applications

Application

Create and manage applications.

Application Name ⇕	Application ID	Region	Domain Name	Updated Time	Status	Advanced Settings	Action
[redacted] Live Demo		United States	[redacted]	9/14/2023, 4:37:49 PM	Completed	0 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	11/11/2024, 1:42:17 PM	Pro Engagement	3 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	11/14/2024, 11:16:59 AM	Pro Engagement	0 Pending 0 Verified 0 Failed	

For more detail on the Pre-provisioning status of a specific application, access its ABP Traffic Insights Dashboard by clicking on its **Application Name**, or by clicking on it's **Status** and selecting **View Dashboard**.



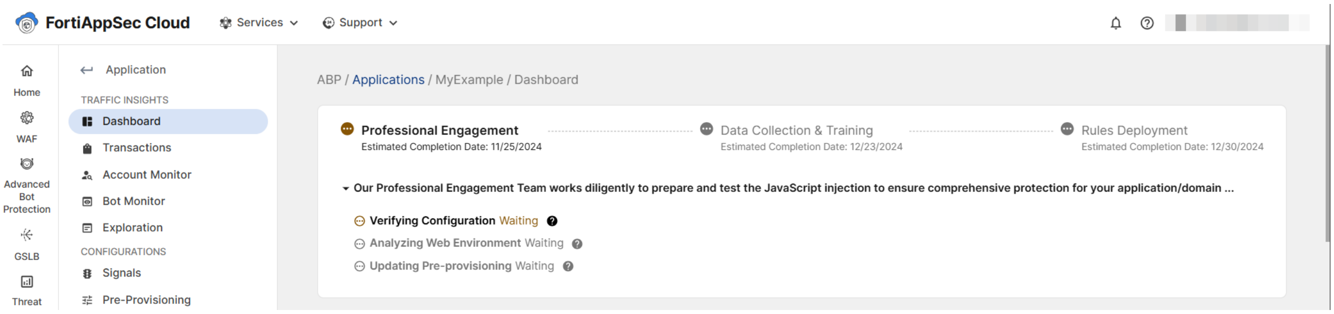
Application

Create and manage applications.

Application Name ⇕	Application ID	Region	Domain Name	Updated Time	Status	Advanced Settings	Action
demosite Live Demo		United States	demosite.prophetsec .net	9/14/2023, 4:37:49 PM	Completed	0 Pending 0 Verified 0 Failed	
MyExample		United States	example.com	11/11/2024, 1:42:17 PM	Pro Engagement	3 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	1		0 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	1		0 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	1		0 Pending 0 Verified 0 Failed	

Verifying Configuration
Analyzing Web Environment
Updating Pre-provisioning

Estimated Completion Date: 11/25/2024



ABP / Applications / MyExample / Dashboard

Professional Engagement
Estimated Completion Date: 11/25/2024

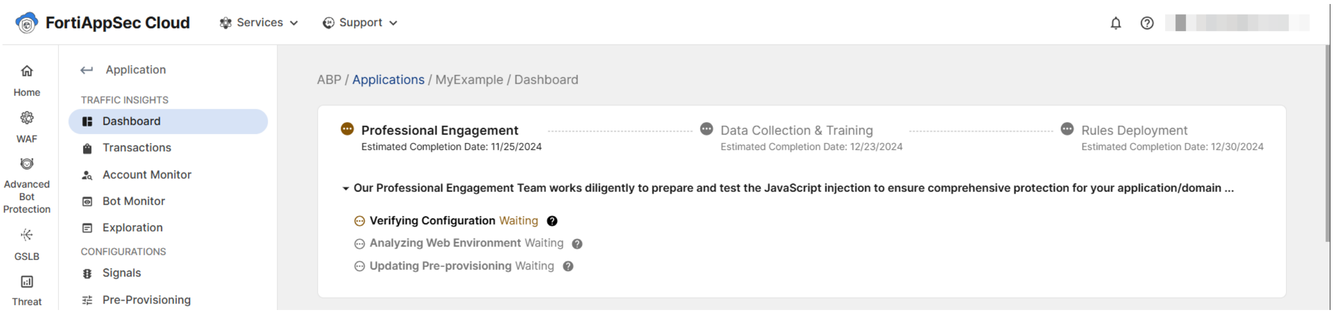
Data Collection & Training
Estimated Completion Date: 12/23/2024

Rules Deployment
Estimated Completion Date: 12/30/2024

Our Professional Engagement Team works diligently to prepare and test the JavaScript injection to ensure comprehensive protection for your application/domain ...

Verifying Configuration Waiting
Analyzing Web Environment Waiting
Updating Pre-provisioning Waiting

Professional Engagement



Professional Engagement
Estimated Completion Date: 11/25/2024

Data Collection & Training
Estimated Completion Date: 12/23/2024

Rules Deployment
Estimated Completion Date: 12/30/2024

Our Professional Engagement Team works diligently to prepare and test the JavaScript injection to ensure comprehensive protection for your application/domain ...

Verifying Configuration Waiting
Analyzing Web Environment Waiting
Updating Pre-provisioning Waiting

The Professional Engagement Team (PET) at Fortinet simplifies and improves the onboarding process for Advanced Bot Protection SaaS. By performing site surveys and pre-provisioning tasks, the PET ensures seamless integration and top performance. They also develop strategies to combat bot attacks and prepare the required JavaScript to gather client information.

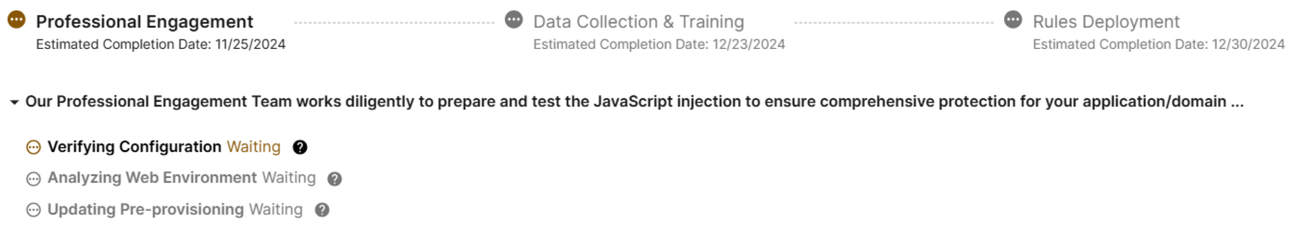
The following section provides an overview of the tasks performed by the PET.

Professional Engagement process overview:

1. **Customer Onboarding and Alert System**
   - When a customer adds their website domain to the Advanced Bot Protection web UI, the PET is immediately alerted and begins the onboarding process.
2. **Website Information Gathering**
   - Site Survey: PET conducts an initial site survey to understand the structure and functionality of the customer's website.
   - Information Collection: The team collects detailed information about the website, including key pages, traffic patterns, and existing performance metrics.
3. **JavaScript Generation for Client-Side Data Collection**
   - Custom JavaScript Creation: Based on the collected information, the PET generates customized JavaScript code tailored to the customer's website.
   - Specific Pages Targeting: The JavaScript is designed to collect data from specific pages crucial for bot protection.
4. **Performance Testing of JavaScript**
   - Integration Testing: PET integrates the JavaScript into a test environment to ensure it functions correctly.
   - Performance Evaluation: The team conducts thorough performance tests to ensure the JavaScript does not negatively impact the website's performance.
   - Optimization: If any performance issues are detected, the PET optimizes the JavaScript code to resolve them.
5. **Information Storage and Accessibility**
   - Data Storage: All collected data and performance test results are securely stored in a centralized system.
   - Easy Access: The stored information is organized for easy access and use by the PET and the customer for ongoing monitoring and adjustments.
6. **Save Information**
   - Once the pre-provisioning steps are complete, the PET ensures that all data and configurations are accurately set up for Advanced Bot Protection.
   - The bot protection system then uses this data to train and set appropriate rules tailored to the customer's website.

The PET is striving to enhance efficiency by developing automated features.

Data Collection and Training



Professional Engagement
Estimated Completion Date: 11/25/2024

Data Collection & Training
Estimated Completion Date: 12/23/2024

Rules Deployment
Estimated Completion Date: 12/30/2024

Our Professional Engagement Team works diligently to prepare and test the JavaScript injection to ensure comprehensive protection for your application/domain ...

Verifying Configuration Waiting

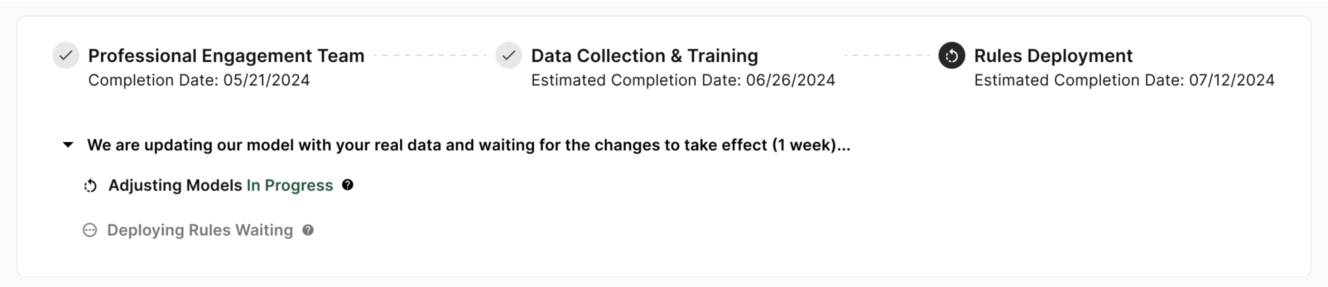
Analyzing Web Environment Waiting

Updating Pre-provisioning Waiting

After the professional engagement phase, we enter a period dedicated to thorough customer data collection and analysis. This data collection is essential for training our machine learning models, which helps to distinguish between legitimate user activity and malicious bot traffic accurately. During this time, we also establish initial security rules and models explicitly tailored to the customer's website. This process ensures that the bot protection system is finely tuned to effectively identify and mitigate potential threats, providing robust security from the start.

The duration of this phase depends on the website's complexity and the volume of traffic data, typically ranging from 2 to 4 weeks. You can find the completion date displayed on your dashboard.

Rules Deployment



Professional Engagement Team
Completion Date: 05/21/2024

Data Collection & Training
Estimated Completion Date: 06/26/2024

Rules Deployment
Estimated Completion Date: 07/12/2024

We are updating our model with your real data and waiting for the changes to take effect (1 week)...

Adjusting Models In Progress

Deploying Rules Waiting

In this stage, we implement effective measures derived from the information and strategies gathered in earlier stages, and make final adjustments before deploying them on your website.

The duration of this phase typically ranges from 3 days to 1 week, depending on the website's complexity and volume of traffic data. You can find the completion date displayed on your dashboard.

Integrating Advanced Bot Protection into the Fortinet Security Fabric

After your Advanced Bot Protection Application has been created, you can integrate it with Fortinet Fabric devices to deploy Advanced Bot Protection for the Application traffic.

The FortiAppSec Cloud system is designed to seamlessly integrate with your existing infrastructure, supporting various products in the Fortinet Security Fabric.

Currently, the following Fortinet products are supported for integration:

- FortiADC — See FortiADC Integration on page 214 for detailed steps on how to set up the ABP integration with FortiADC.
- FortiWeb — See FortiWeb Integration on page 220 for detailed steps on how to set up the ABP integration with FortiWeb.

The ABP integration with FortiADC/FortiWeb works by using client information collected by JavaScript insertion, which allow the client and FortiADC/FortiWeb (via Fabric connector) to communicate with the Advanced Bot Protection Cloud for data telemetry information (such as headers and device fingerprinting). Once the FortiADC/FortiWeb is connected with ABP, an Advanced Bot Protection policy can be configured to apply to the server policy. The FortiADC/FortiWeb reports the telemetry data to ABP which then inspects the HTTP/S request to determine if the client is a human or a bot, and sends instructions back to FortiADC/FortiWeb to initiate an action against the request (such as block, CAPTCHA, or allow).

For instructions on how to enable using Advanced Bot Protection as a module within WAF, refer to Advanced Bot Protection on page 120.

Before you begin:

- You must have access to the Fortinet connector device and have read-write permission for security settings.
- Ensure the account used to register for the ABP license matches the account information from your Fortinet Support Contract. Otherwise, the connector device will not be able to connect to ABP.
- You must have created a ABP Application and have obtained its Application ID.

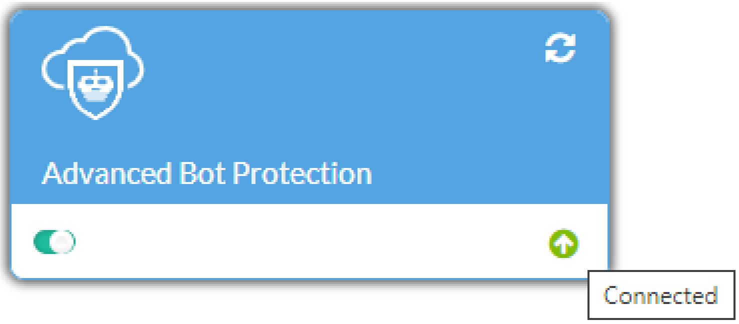
FortiADC Integration

Login to FortiADC and follow the steps below to integrate ABP with FortiADC.
For more details about the ABP integration with FortiADC, see the FortiADC Handbook on Advanced Bot Protection.

Step 1: Enable the Advanced Bot Protection Fabric Connector

FortiADC is pre-configured to connect to the ABP server, so you only need to enable the connection via the Advanced Bot Protection Fabric connector.

1. Go to **Security Fabric > Fabric Connectors**.
2. Under **Other Fortinet Products** section, locate the **Advanced Bot Protection** connector.
3. **Enable** the Advanced Bot Protection connector. Once the connector is enabled, the connection status will display. The Advanced Bot Protection connector is ready when the status is **Connected**.



4. The ⬆ and ⬇ icons indicate whether the Advanced Bot Protection connector has successfully connected to the ABP server. Hover over the Advanced Bot Protection connector to see the status details. The table below lists the possible connection statuses for the Advanced Bot Protection connector.

Icon	ABP connector status	Guidelines
⬆	Connected	The [[[Undefined variable Deployment Guide.ProductName]]] is

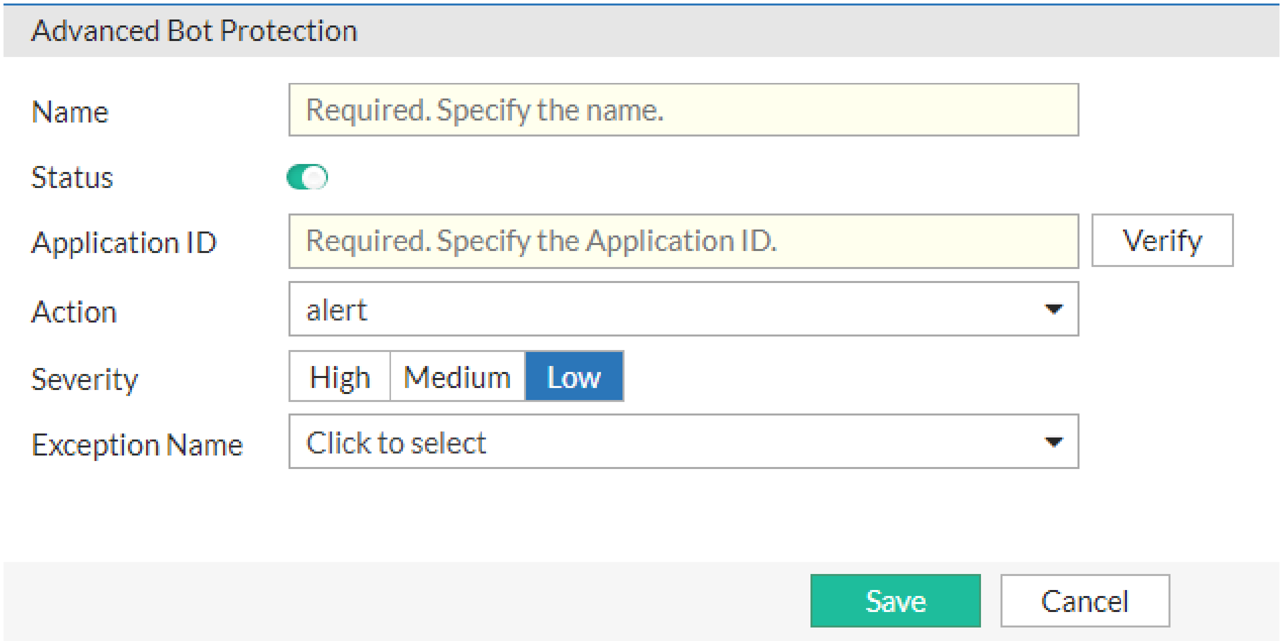
Icon	ABP connector status	Guidelines
		successfully connected to to the ABP server.
⬇	Account license invalid	The ABP license is not valid. Please verify your license details or contact Fortinet Support.
⬇	Couldn't connect to server	Unable to connect to the ABP server. Please check your network settings.
⬇	Couldn't resolve hostname	Unable to resolve the hostname of the ABP server. Please check your network settings.
⬇	No available SN cert	The device does not have an available SN certificate. Please check your local certificate.
⬇	No available CA cert	The device does not have an available CA certificate. Please check your CA certificate.
⬇	Problem with the local certificate	An error occurred with the remote server certificate. Please check your local certificate.
⬇	SSL peer certificate or SSH remote key was not OK	An error occurred with the remote server certificate involving the SSL peer certificate or SSH remote key. Please check your local certificate.

Once the Advanced Bot Protection fabric connector is successfully connected, the Advanced Bot Protection module becomes available under the Web Application Firewall menu in the GUI.

Step 2: Configure an Advanced Bot Protection policy

Connect your ABP Application to the FortiADC Advanced Bot Protection policy by using the Application ID. Through the Application ID, the FortiADC will have access to the Pre-Provisioned resources to apply to the specified protected URLs and JavaScript insertion locations to collect client information for bot detection.

1. Go to **Web Application Firewall > Advanced Bot Protection**.
2. In the **Advanced Bot Protection** tab, click **Create New** to display the configuration editor.



Advanced Bot Protection

Name: Required. Specify the name.

Status: ●

Application ID: Required. Specify the Application ID.

Action: alert

Severity: High | Medium | [✓ Low]

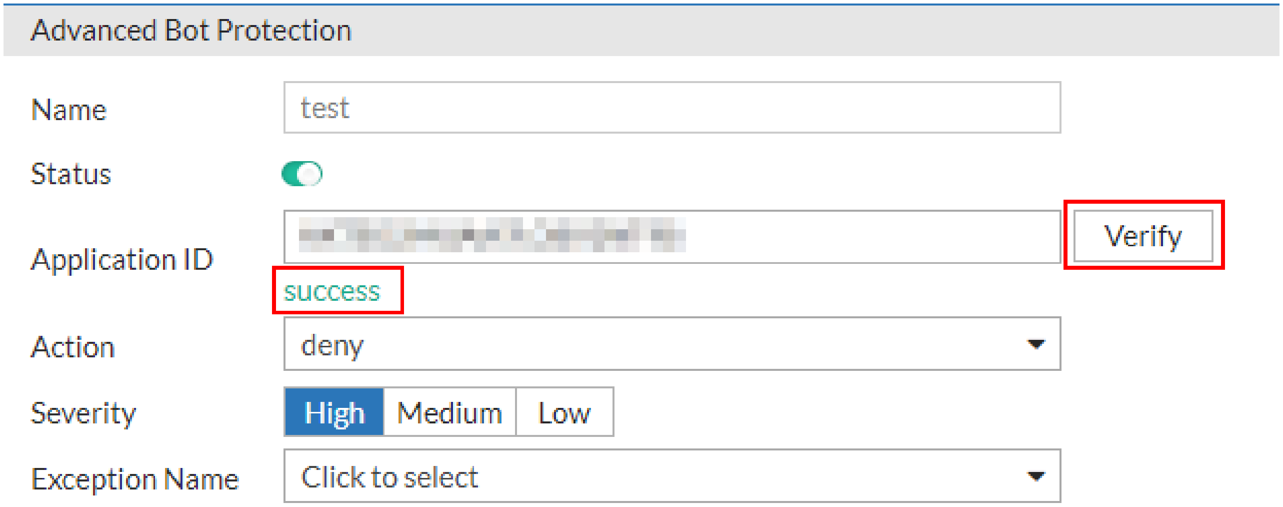
Exception Name: Click to select

3. Configure the following Advanced Bot Protection settings:

Setting	Description
Name	Specify a name for the Advanced Bot Protection policy. Valid characters are `A-Z`, `a-z`, `0-9`, `_`, and `-`. No spaces. The configuration name cannot be edited once it has been saved.
Status	Enable/disable the status of this Advanced Bot Protection policy. **Status** must be **enabled** to display Advanced Bot Protection configuration options.
Application ID	Specify the Application ID assigned to your ABP Application. The Application ID is used to bind this Advanced Bot Protection policy to the ABP Application. To obtain the ID, go to **Application** page of ABP, locate your ABP Application and copy the ID from the **Application ID** column.
Action	Specify a WAF action object to apply when a bot is detected. You can specify a predefined or user-defined WAF action profile. Predefined WAF actions: • alert — WAF policies will allow the traffic to pass and log the event. • block — WAF policies will drop the current attack session by HTTP 403 message and block the attacker (according the attacker's IP address) for 1 hour, and log the event. • captcha — WAF policies will allow the traffic to pass if the client successfully fulfills the CAPTCHA request, and log the event. • deny — WAF policies will the drop current attack session by HTTP 403 message, and log the event.

Setting	Description
	• silent-deny — WAF policies will drop the current attack session by HTTP 403 message, without logging the event. The default action is alert.
Severity	Select the event severity to log when a bot is detected: • High — Log as high severity events. • Medium — Log as a medium severity events. • Low — Log as low severity events. The default is Low.
Exception Name	Select an exception configuration object. Exceptions identify specific hosts or URL patterns that are not subject to processing by this rule.

4. Optionally, click **Verify** to validate the inputted Application ID against multiple parameters to ensure the connection between FortiADC and the ABP Application is successfully established.



Advanced Bot Protection

Name	test
Status	●
Application ID	[redacted] success
Action	deny
Severity	[✓ High] Medium Low
Exception Name	Click to select

The Advanced Bot Protection policy can only function if the Application ID is valid and the connection to the ABP server is successfully established. FortiADC validates multiple parameters, including if the Application ID is available, the ABP server connectivity, if the ABP license is valid. There are two types of messages as differentiated by text color: green text indicates a positive status where all required parameters are validated successfully; and red text that indicate one or more parameters did not pass validation.
The following table describes some common verification results.

Verification status message	Guidelines
Success (green)	All required parameters pass validation; application ID is available, ABP server certificate is valid, network connectivity is good, etc.
Application not found (red)	The Application ID does not exist. This could be an input error.
Account license invalid (red)	The ABP license is not valid. Please verify your license details or contact Fortinet Support.
Couldn't connect to server (red)	Unable to connect to the ABP server. Please check your network settings.

Verification status message	Guidelines
Couldn't resolve hostname (red)	Unable to resolve the hostname of the ABP server. Please check your network settings.
No available SN cert (red)	The device does not have an available SN certificate. Please check your local certificate.
No available CA cert (red)	The device does not have an available CA certificate. Please check your CA certificate.
Problem with the local certificate	An error occurred with the remote server certificate. Please check your local certificate.
SSL peer certificate or SSH remote key was not OK	An error occurred with the remote server certificate involving the SSL peer certificate or SSH remote key. Please check your local certificate.

5. Click **Save**.
   Once the Advanced Bot Protection policy is saved, you can reference it in a WAF Profile configuration.

It is strongly recommended to verify the Application ID and ABP server connection prior to completing the Advanced Bot Protection policy configuration. Even though this is an optional step, it is helpful to diagnose any potential issues and apply fixes early.

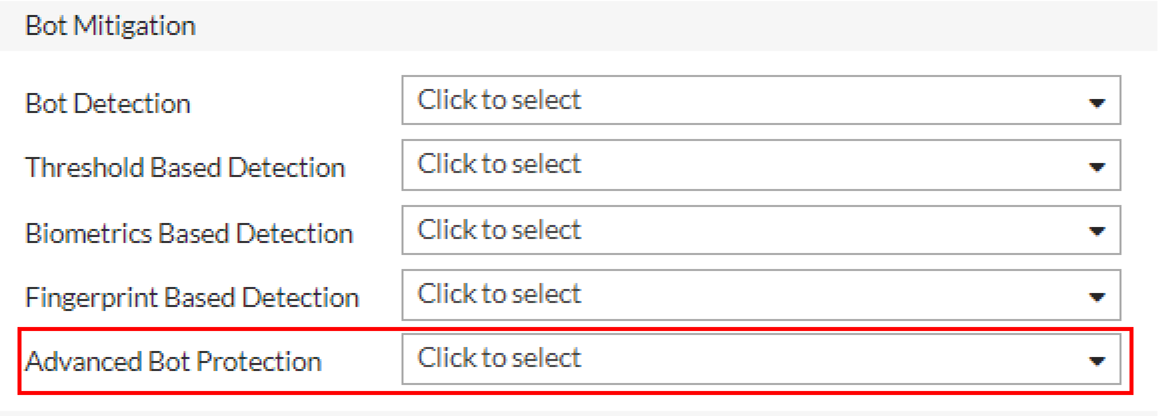
When the Advanced Bot Protection policy is created, an internal verification is automatically conducted to verify the status of the Application ID and ABP server connection. If the Application ID is not valid, or any other validation parameters has failed, the Advanced Bot Protection policy will fail to function and the system will log the failure to send the ABP policy.

Step 3: Apply the Advanced Bot Protection policy in a WAF profile and virtual server policy

After configuring the Advanced Bot Protection policy, apply it in a WAF profile. Then, apply the WAF profile that references the Advanced Bot Protection policy to a virtual server to activate Advanced Bot Protection for server load balancing.

1. Go to **Web Application Firewall > WAF Profile**.
   The configuration page displays the **WAF Profile** tab.
2. Edit an existing WAF Profile configuration, or click **Create New** to create a new WAF Profile to apply the Advanced Bot Protection policy.

3. Under the Bot Mitigation section, select the Advanced Bot Protection policy you have previously configured and click **Save** to commit.



Bot Mitigation

Bot Detection: Click to select

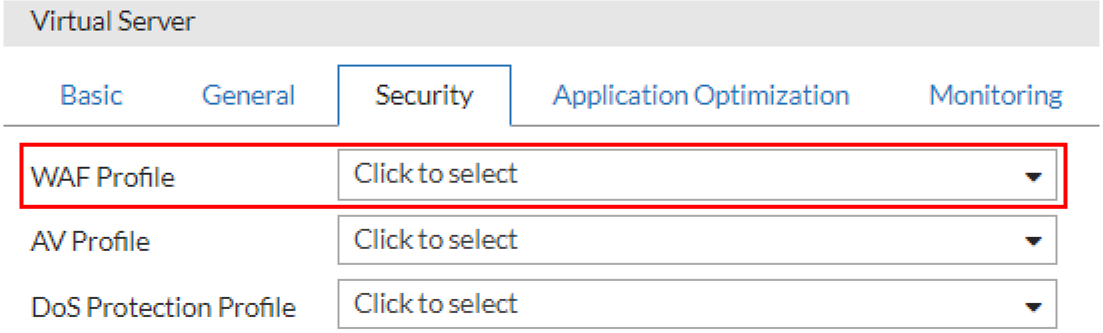
Threshold Based Detection: Click to select

Biometrics Based Detection: Click to select

Fingerprint Based Detection: Click to select

Advanced Bot Protection: Click to select

4. Go to **Server Load Balance > Virtual Server**.
   The configuration page displays the **Virtual Server** tab.
5. Edit an existing Virtual Server configuration or click Create New > Advanced to create a new virtual server configuration to apply the WAF profile that references the Advanced Bot Protection policy.
6. Click the **Security** tab and select the WAF Profile configuration that references the Advanced Bot Protection policy. Click **Save** to commit.



Virtual Server

WAF Profile: Click to select

AV Profile: Click to select

DoS Protection Profile: Click to select

Once the Advanced Bot Protection Policy is applied to the WAF Profile and referenced in a virtual server, whenever HTTP/S requests are made on the protected Application, FortiADC will report to ABP the telemetry data collected from the client via JavaScript insertion. Each HTTP/S request is inspected and ABP will determine if the client is a human or a bot and will send instructions back to FortiADC to initiate an action against the request (such as block, CAPTCHA, or allow). FortiADC will log each security action triggered by the Advanced Bot Protection.

The FortiADC Advanced Bot Protection policy does not activate until the ABP Application is fully analyzed and Pre-Provisioned to protect the Application.

Pre-Provisioning is required to identify all URLs that should be protected in your Application domain (such as login URLs), and the locations to which JavaScript need to be inserted to collect client information. Without these resources, FortiADC will not be able to insert the necessary JavaScript for bot detection.

Pre-Provisioning is triggered upon creating the Application, and requires 2 to 3 days to complete. During this process, your ABP Application will be in **Pending** status until Pre-Provisioning is complete. When the Application status is **Ready**, Advanced Bot Protection can be activated in your FortiADC.

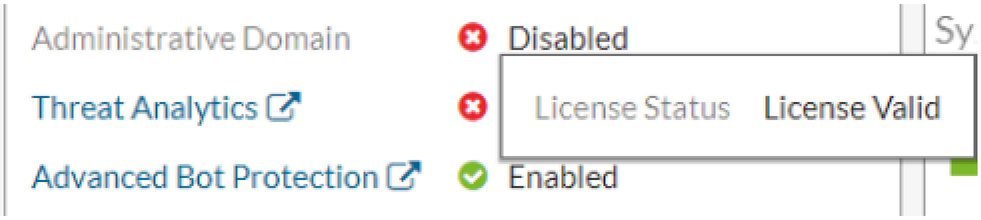
FortiWeb Integration

Login to FortiWeb and follow the steps below to integrate ABP with FortiWeb.
For more details about the ABP integration with FortiWeb, see the FortiWeb Handbook on Advanced Bot Protection.

Step 1: Enable Advanced Bot Protection

FortiWeb is pre-configured to connect to the ABP server, so you only need to enable the connection via the Advanced Bot Protection Fabric connector.

1. Go to **Dashboard > Status**.
2. In the **System Information** widget, click **Enable Advanced Bot Protection**, then click **OK** in the pop-up window.
3. Check the status of **Advanced Bot Protection** in the **Licenses** widget on the **Dashboard > Status** page. It should display as **Valid**.



Administrative Domain	✗	Disabled
Threat Analytics	✗	
Advanced Bot Protection	✓	Enabled

License Status License Valid

Step 2: Configure an Advanced Bot Protection policy

Connect your ABP Application to the FortiWeb Advanced Bot Protection policy by using the Application ID. Through the Application ID, FortiWeb will receive bot detection suggestions from ABP regarding the traffic of this application, and then take corresponding actions.

1. Go to **Bot Mitigation > Advanced Bot Protection**.
2. Click **Create New** to display the configuration editor.
3. Configure the following Advanced Bot Protection settings:

Setting	Description
Name	Enter a name for the Advanced Bot Protection policy. You can reference it in the Web Protection Profile.
Application ID	Enter the Application ID assigned to your ABP Application. The Application ID is used to bind this Advanced Bot Protection policy to the ABP Application. To obtain the ID, go to **Application** page of ABP, locate your ABP Application and copy the ID from the **Application ID** column.
Action	Select which action FortiWeb will take when ABP suggests the request is from a bot: • Alert — Accept the connection and generate an alert email and/or log message. • Alert & Deny — Block the request (or reset the connection) and generate an alert and/or log message. • Deny (no log) — Block the request (or reset the connection).

Setting	Description
	• Block Period — Block subsequent requests from the same IP address for a number of seconds. • Client ID Block Period — Block a malicious or suspicious client based on the FortiWeb generated client ID. This is useful when the source IP of a certain client keeps changing. This option takes effect only when you enable Client Management in the Server Policy. The default value is Alert.
Period Block	Enter the number of seconds that you want to block subsequent requests from a client. The valid range is 1–3,600 seconds (1 hour). This setting is available only if **Action** is set to **Period Block** and **Client ID Block Period**.
Severity	When request from a bot is recorded in the attack log, each log message contains a **Severity Level** (`severity_level`) field. Select which severity level FortiWeb will use: • Informative • Low • Medium • High The default value is **Medium**.
Trigger Policy	Select the trigger, if any, that FortiWeb will use when it logs and/or sends an alert email about ABP violation.
Exception	Select the exception policy which specifies the elements to be exempted from the ABP scan.
Bot confirmation	Enable it to send clients bot verification requests.
Verification Method	• CAPTCHA Enforcement — Requires the client to successfully fulfill a CAPTCHA request. CAPTCHA verification will not pop out for the bot confirmation again for the same user within 10 mins timeout. • reCAPTCHA Enforcement — Requires the client to successfully fulfill a reCAPTCHA request.
reCAPTCHA	Select the reCAPTCHA server you have created in the reCAPTCHA Server tab in **User > Remote Server**.
Validation Timeout	Enter the maximum amount of time (in seconds) that FortiWeb waits for results from the client.
Max Attempt Times	If **CAPTCHA Enforcement** is selected for **Verification Method**, enter the maximum number of attempts that a client may attempt to fulfill a CAPTCHA request. Available only when the **Verification Method** is **CAPTCHA Enforcement**.

4. Click **OK**.

Step 3: Apply the Advanced Bot Protection policy in a Web Protection Profile

After configuring the Advanced Bot Protection policy, apply it in a Web Protection Profile to activate Advanced Bot Protection.

1. Go to **Policy > Web Protection Profile**.
2. Select the **Inline Protection Profile** tab.
3. Select an existing web protection profile to which you want to include the Advanced Bot Protection policy.
4. Click **Edit**.
5. For **Bot Mitigation > Advanced Bot Protection**, select the Advanced Bot Protection policy from the drop-down list.
   Note: To view details about a selected Advanced Bot Protection policy, click the view icon next to the drop-down list.
6. Click **OK**.

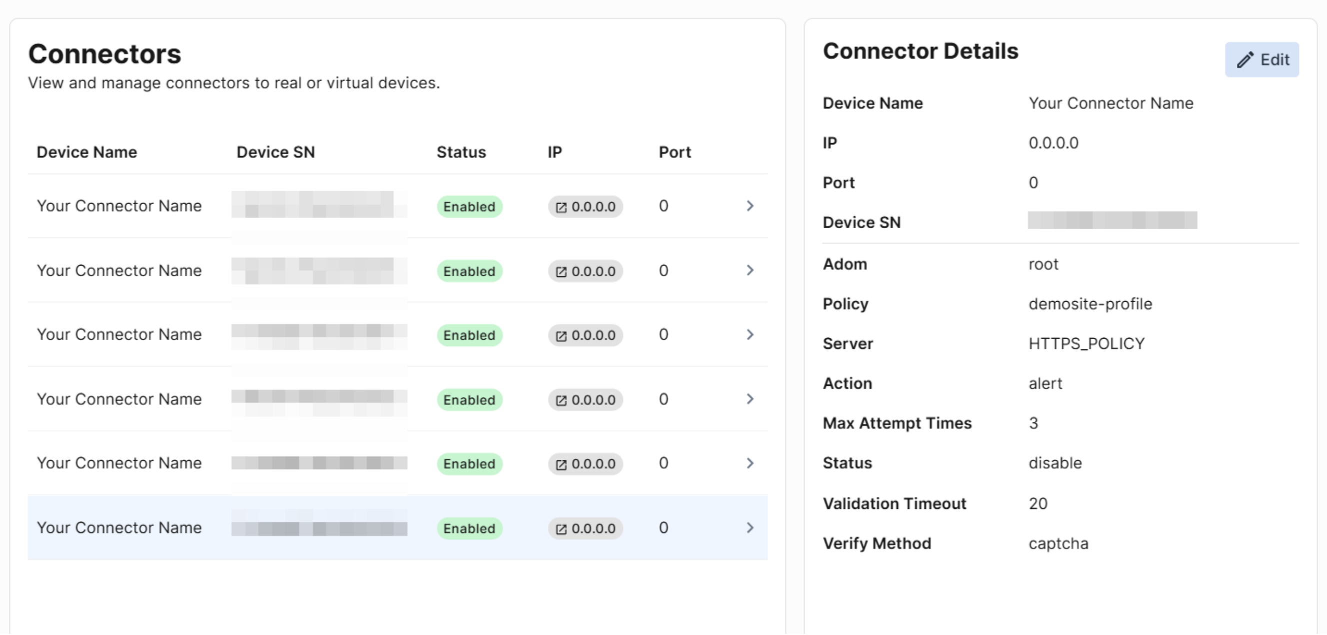
The FortiWeb Advanced Bot Protection policy does not activate until the ABP Application is fully analyzed and Pre-Provisioned to protect the Application.

Pre-Provisioning is required to identify all URLs that should be protected in your Application domain (such as login URLs), and the locations to which JavaScript need to be inserted to collect client information. Without these resources, FortiWeb will not be able to insert the necessary JavaScript for bot detection.

Pre-Provisioning is triggered upon creating the Application, and requires 2 to 3 days to complete. During this process, your ABP Application will be in **Pending** status until Pre-Provisioning is complete. When the Application status is **Ready**, Advanced Bot Protection can be activated in your FortiWeb.

After Integration

After connecting your ABP Application to FortiWeb or FortiADC, you can manage its connectors under **Configurations > Connectors**.



Connectors

View and manage connectors to real or virtual devices.

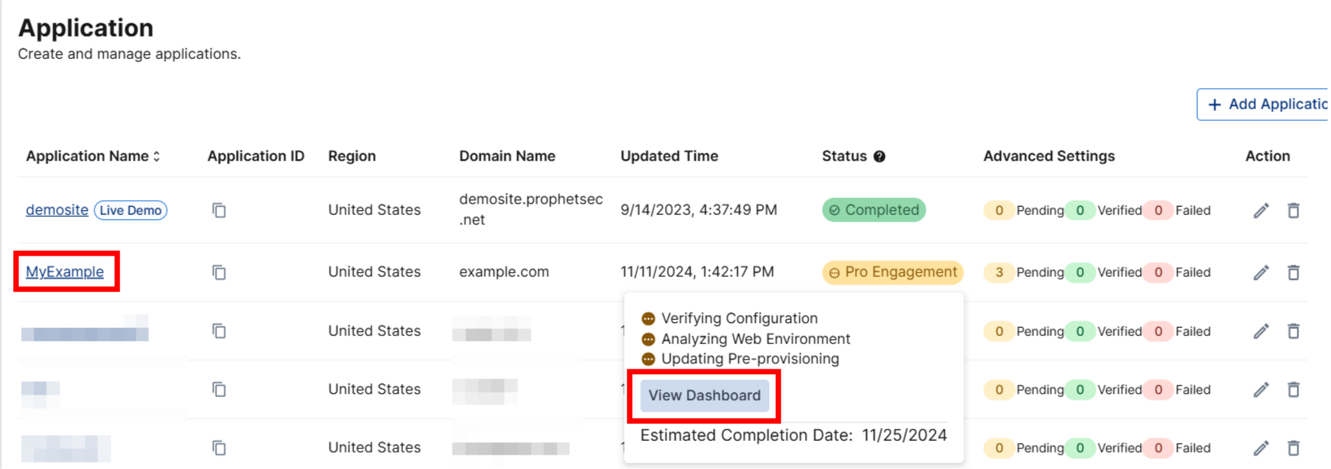
Device Name	Device SN	Status	IP	Port
Your Connector Name	[redacted]	Enabled	0.0.0.0	0
Your Connector Name	[redacted]	Enabled	0.0.0.0	0
Your Connector Name	[redacted]	Enabled	0.0.0.0	0
Your Connector Name	[redacted]	Enabled	0.0.0.0	0
Your Connector Name	[redacted]	Enabled	0.0.0.0	0
Your Connector Name	[redacted]	Enabled	0.0.0.0	0

Connector Details

Device Name	Your Connector Name
IP	0.0.0.0
Port	0
Device SN	[redacted]
Adom	root
Policy	demosite-profile
Server	HTTPS_POLICY
Action	alert
Max Attempt Times	3
Status	disable
Validation Timeout	20
Verify Method	captcha

For more information about the details displayed on this page, refer to Connectors on page 245.

To access this page, navigate to **ABP > Application** and click the **Application Name**, or the desired application's **Status**, then **View Dashboard**.



Application

Create and manage applications.

+ Add Applicatic

Application Name	Application ID	Region	Domain Name	Updated Time	Status	Advanced Settings	Action
demosite Live Demo		United States	demosite.prophetsec .net	9/14/2023, 4:37:49 PM	Completed	0 Pending 0 Verified 0 Failed	
MyExample		United States	example.com	11/11/2024, 1:42:17 PM	Pro Engagement	3 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	1		0 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	1		0 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	1		0 Pending 0 Verified 0 Failed	

- Verifying Configuration
- Analyzing Web Environment
- Updating Pre-provisioning

View Dashboard

Estimated Completion Date: 11/25/2024

ABP Application

On the Application page, you can set up and manage settings for your applications. This involves tasks like adding new applications, checking application details, changing the application's name, and setting up login protection.

Click into each application to view its traffic insights and configurations.

Application Information

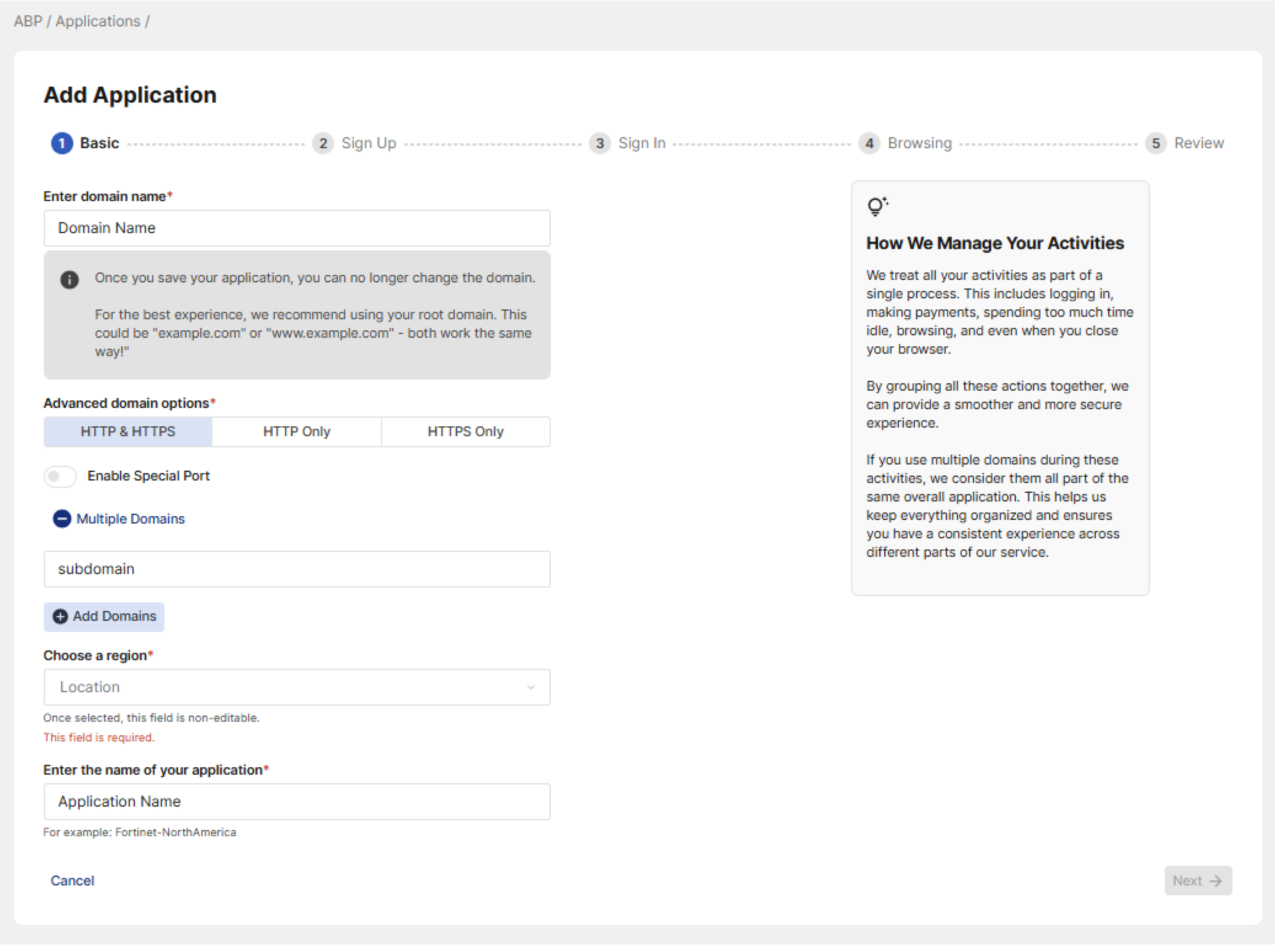
The table on the **Application** page displays all the applications currently under your FortiAppSec Cloud account.

Column	Description
Application Name	The internal name by which this application is displayed within the web portal GUI.
Application ID	This field does not display the Application ID for security reasons. However, you can click the copy icon to securely copy the Application ID to your clipboard.
Region	The region of the ABP service that processes the traffic of your application
Domain Name	The domain name of your application. For example, www.fortinet.com. This field cannot be edited.
Security Service	This field is determined by the terms of your license.
Status	The current state or condition of the security service for your application. Initially "Pending" after creation, it transitions to "Ready" when the PET team finishes configurations and provisioning.

Column	Description
Advanced Settings	This field provides more context for the **Status** of your application. **Pending** – The input URL has been saved, and is now awaiting validation from the Professional Engagement Team (PET). **Failed** – PET has inspected the URL and deemed it invalid. Guidance will be offered through feedback to assist in achieving the "Verified" status. **Verified** – The input URL has been validated by the PET and is now under protection.

Onboard ABP Applications

1. Click **Create New**. This opens the **Create Application** wizard.
2. **Basic Information**



ABP / Applications /

Add Application

Enter domain name*

Domain Name

Once you save your application, you can no longer change the domain.

For the best experience, we recommend using your root domain. This could be "example.com" or "www.example.com" - both work the same way!"

Advanced domain options*

subdomain

Choose a region*

Location

Once selected, this field is non-editable.

This field is required.

Enter the name of your application*

Application Name

For example: Fortinet-NorthAmerica

How We Manage Your Activities

We treat all your activities as part of a single process. This includes logging in, making payments, spending too much time idle, browsing, and even when you close your browser.

By grouping all these actions together, we can provide a smoother and more secure experience.

If you use multiple domains during these activities, we consider them all part of the same overall application. This helps us keep everything organized and ensures you have a consistent experience across different parts of our service.

Enter the following mandatory fields:

Field	Description	Example Input
Domain Name	The domain name of your application. This field	www.fortinet.com

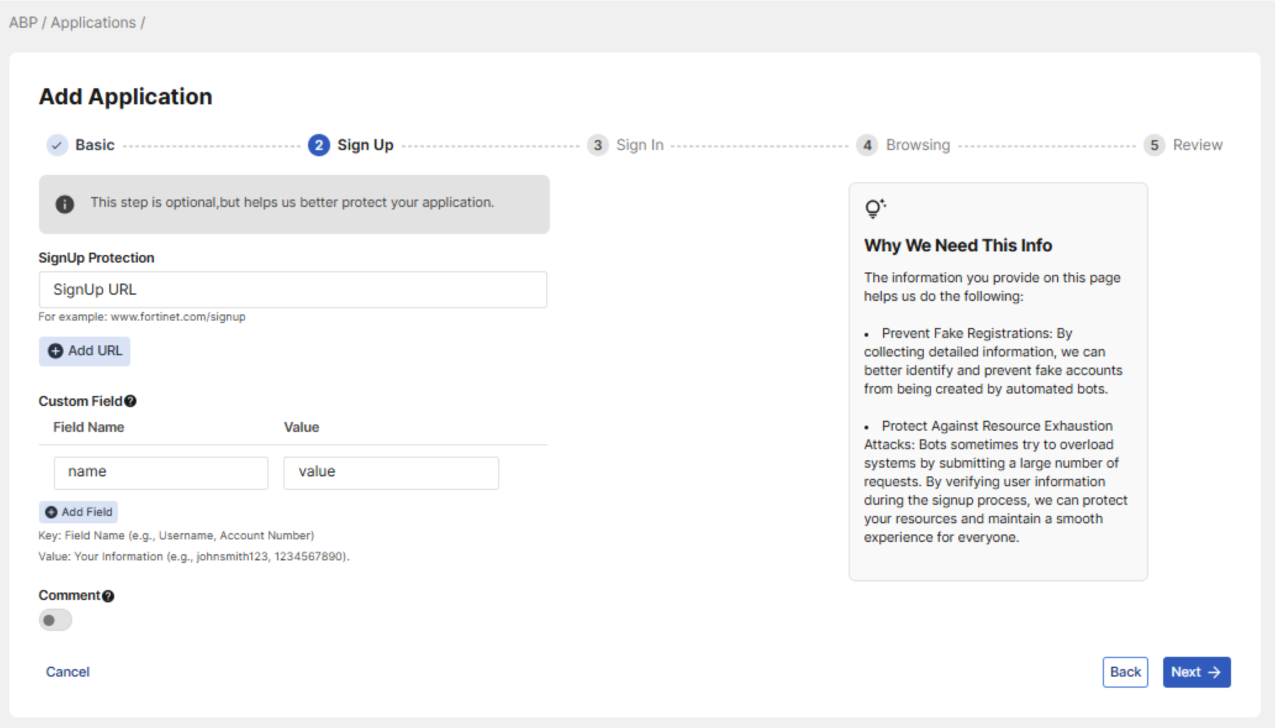
Field	Description	Example Input
	does not support wildcard, and cannot be edited.	
Advanced domain options	Select the ports used by your application. If you restrict traffic to only HTTP or HTTPS, you can **Enable Special Port** if you are not using the default ports (80 for HTTP or 443 for HTTPS).	
Multiple Domains	Enter up to 10 subdomains of your application to ensure comprehensive protection	store.fortinet.com
Region	The location of the Advanced Bot Protection service that processes the traffic of your application	US
Application Name	The internal name by which this application is displayed within your web portal GUI.	Fortinet-NA

3. **Sign Up**

While **Sign Up** URLs are automatically detected during pre-provisioning, manually entering additional information about your application pages helps us do the following:

- Prevent Fake Registrations: By collecting detailed information, we can better identify and prevent fake accounts from being created by automated bots.
- Protect Against Resource Exhaustion Attacks: Bots sometimes try to overload systems by submitting a large number of requests. By verifying user information during the signup process, we can protect your resources and maintain a smooth experience for everyone.

For details, see Pre-Provisioning Application resources on page 210.



Add Application

This step is optional,but helps us better protect your application.

SignUp Protection

SignUp URL

For example: www.fortinet.com/signup

Custom Field

Field Name	Value
name	value

Key: Field Name (e.g., Username, Account Number)

Value: Your Information (e.g., johnsmith123, 1234567890).

Comment

Why We Need This Info

The information you provide on this page helps us do the following:

- Prevent Fake Registrations: By collecting detailed information, we can better identify and prevent fake accounts from being created by automated bots.
- Protect Against Resource Exhaustion Attacks: Bots sometimes try to overload systems by submitting a large number of requests. By verifying user information during the signup process, we can protect your resources and maintain a smooth experience for everyone.

Enter the following:

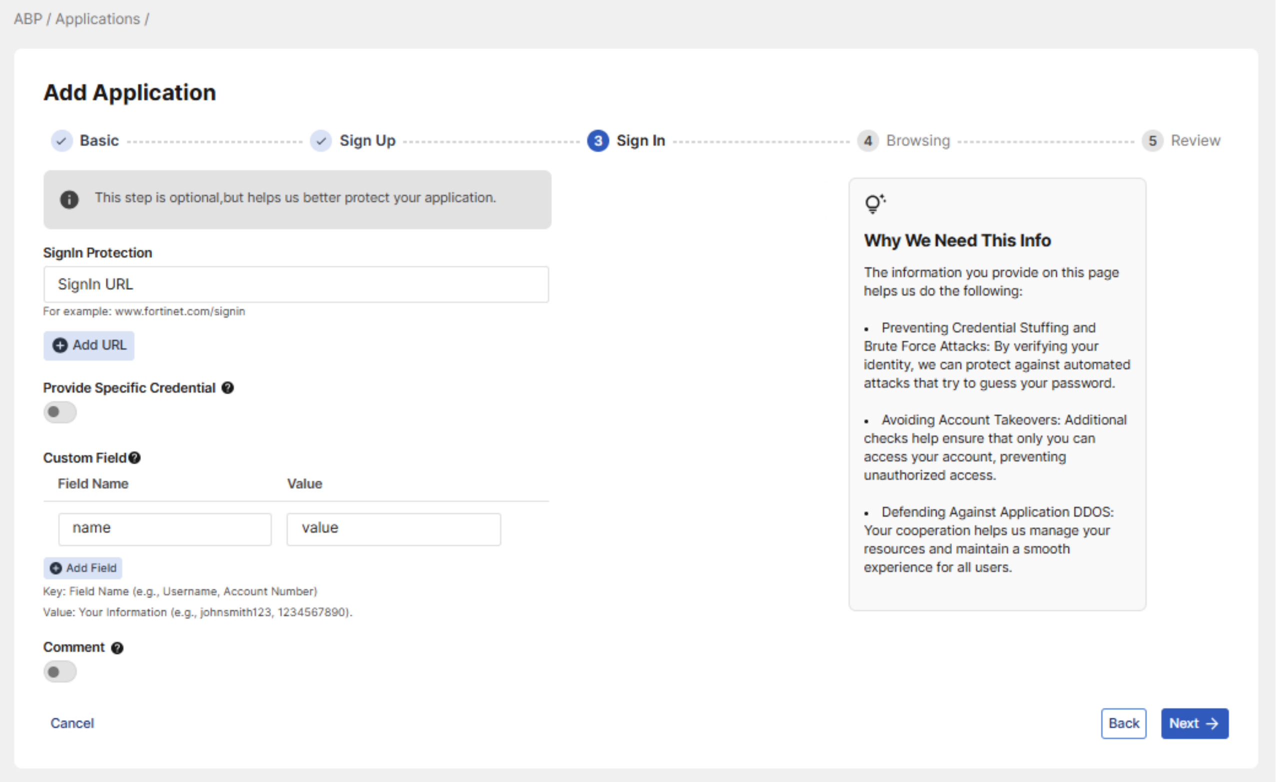
Field	Description	Example Input
SignUp Protection	Enter your application's sign up URL(s). If you have multiple signup pages, click **Add URL** to add additional input fields.	http://www.fortinet.com/register
Custom Field	Optional: Enable this option to specify input fields that contain user verification values beyond sign-in or sign-up credentials, and provide a test input value. For **Value**, enter a valid test value that will direct us to the pages accessed by a user. This helps us analyze more user-accessed pages without impacting your actual user data.	**Field name:** phone number **Value:** 1234567890
Comment	Optional: Use this space to give us any additional information on your application you would like us to know.	

4. **Sign In**

While **Sign In** URLs are automatically detected during pre-provisioning, manually entering additional information about your application pages helps us do the following:

- Preventing Credential Stuffing and Brute Force Attacks: By verifying user identities, we can protect against automated attacks that attempt to guess passwords.
- Avoiding Account Takeovers: Additional checks ensure that only the account owner can access the account, preventing unauthorized access.
- Defending Against Application DDOS: Your cooperation helps us manage your resources and maintain a smooth experience for all users.

For details, see Pre-Provisioning Application resources.



Add Application

This step is optional,but helps us better protect your application.

SignIn Protection

SignIn URL

For example: www.fortinet.com/signin

Provide Specific Credential

Custom Field

Field Name	Value
name	value

Key: Field Name (e.g., Username, Account Number)

Value: Your Information (e.g., johnsmith123, 1234567890).

Comment

Why We Need This Info

The information you provide on this page helps us do the following:

- Preventing Credential Stuffing and Brute Force Attacks: By verifying your identity, we can protect against automated attacks that try to guess your password.
- Avoiding Account Takeovers: Additional checks help ensure that only you can access your account, preventing unauthorized access.
- Defending Against Application DDOS: Your cooperation helps us manage your resources and maintain a smooth experience for all users.

Enter the following:

Field	Description	Example Input
Sign In Protection	Enter your application's sign in URL. If you have multiple login pages, use the plus sign (+) to add additional input fields.	http://www.fortinet.com/login
Provide Specific Credential	Optional: Enable this if you'd like to provide test account credentials for logging into your application. This allows us to analyze additional user-accessed pages without impacting your user data.	**Username:** test_account_1 **Password:** MySecurePass!2024

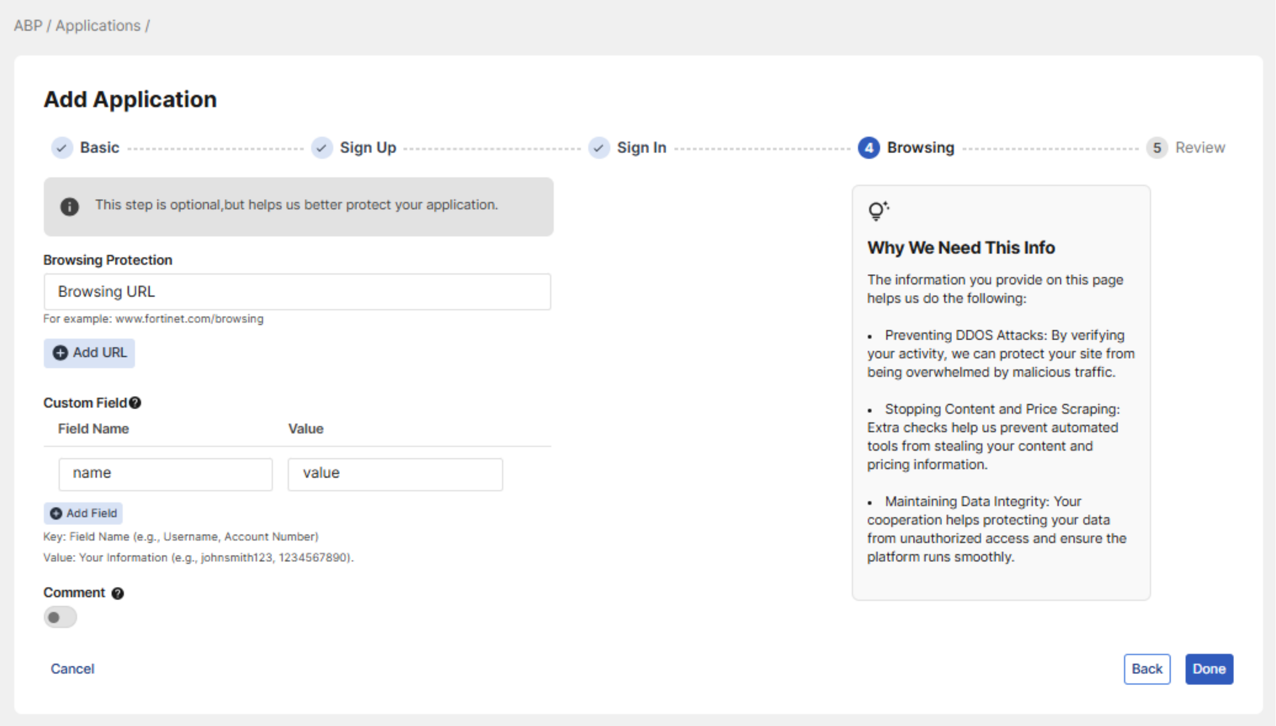
Field	Description	Example Input
Custom Field	Optional: Enable this option to specify input fields that may contain verification values for users other than sign-in credentials. For **Value**, enter a valid test value that will direct us to the pages accessed by a user. This helps us analyze more user-accessed pages without impacting your actual user data.	**Field name:** phone number **Value:** 01234567890
Comment	Optional: Use this space to give us any additional information on your application you would like us to know.	

5. **Browsing Protection**

While **Browsing Protection** URLs are automatically detected during pre-provisioning, manually entering additional information about your application pages helps us do the following:

- **Preventing DDOS Attacks:** By verifying your activity, we can protect your site from being overwhelmed by malicious traffic.
- **Stopping Content and Price Scraping:** Extra checks help us prevent automated tools from stealing your content and pricing information.
- **Maintaining Data Integrity:** Your cooperation helps protect your data from unauthorized access and ensures the platform runs smoothly.

For details, see Pre-Provisioning Application resources.



ABP / Applications /

Add Application

✓ Basic ✓ Sign Up ✓ Sign In 4 Browsing 5 Review

This step is optional,but helps us better protect your application.

Browsing Protection

Browsing URL

For example: www.fortinet.com/browsing

Add URL

Custom Field

Field Name	Value
name	value

Add Field

Key: Field Name (e.g., Username, Account Number)

Value: Your Information (e.g., johnsmith123, 1234567890).

Comment

Cancel

Why We Need This Info

The information you provide on this page helps us do the following:

- Preventing DDOS Attacks: By verifying your activity, we can protect your site from being overwhelmed by malicious traffic.
- Stopping Content and Price Scraping: Extra checks help us prevent automated tools from stealing your content and pricing information.
- Maintaining Data Integrity: Your cooperation helps protecting your data from unauthorized access and ensure the platform runs smoothly.

Back Done

Browsing Protection	Enter URLs for pages that enable user browsing, such as those featuring product categories, online directories, or content exploration feeds. If you have multiple signup pages, click **Add URL** to add additional input fields.	http://www.fortinet.com/products
Custom Field	Optional: Enable this option to specify browsing-related input fields that contain verification values. For **Value**, enter a valid test value that will direct us to the pages accessed by a user. This helps us analyze more user-accessed pages without impacting your actual user data.	**Field name:** tracking number **Value:** 9876543210
Comment	Optional: Use this space to give us any additional information on your application you would like us to know.	

6. **Review information and submit**
   Please ensure all application information is correct before submitting. Note that once submitted, the domain name cannot be edited.

When your URL is verified and the status changes to **Ready**, this means your application is now being protected by FortiAppSec Cloud. You can now navigate to **CONFIGURATIONS > Pre-Provisioning** to see where scripts have been inserted into your application for gathering user behavior.

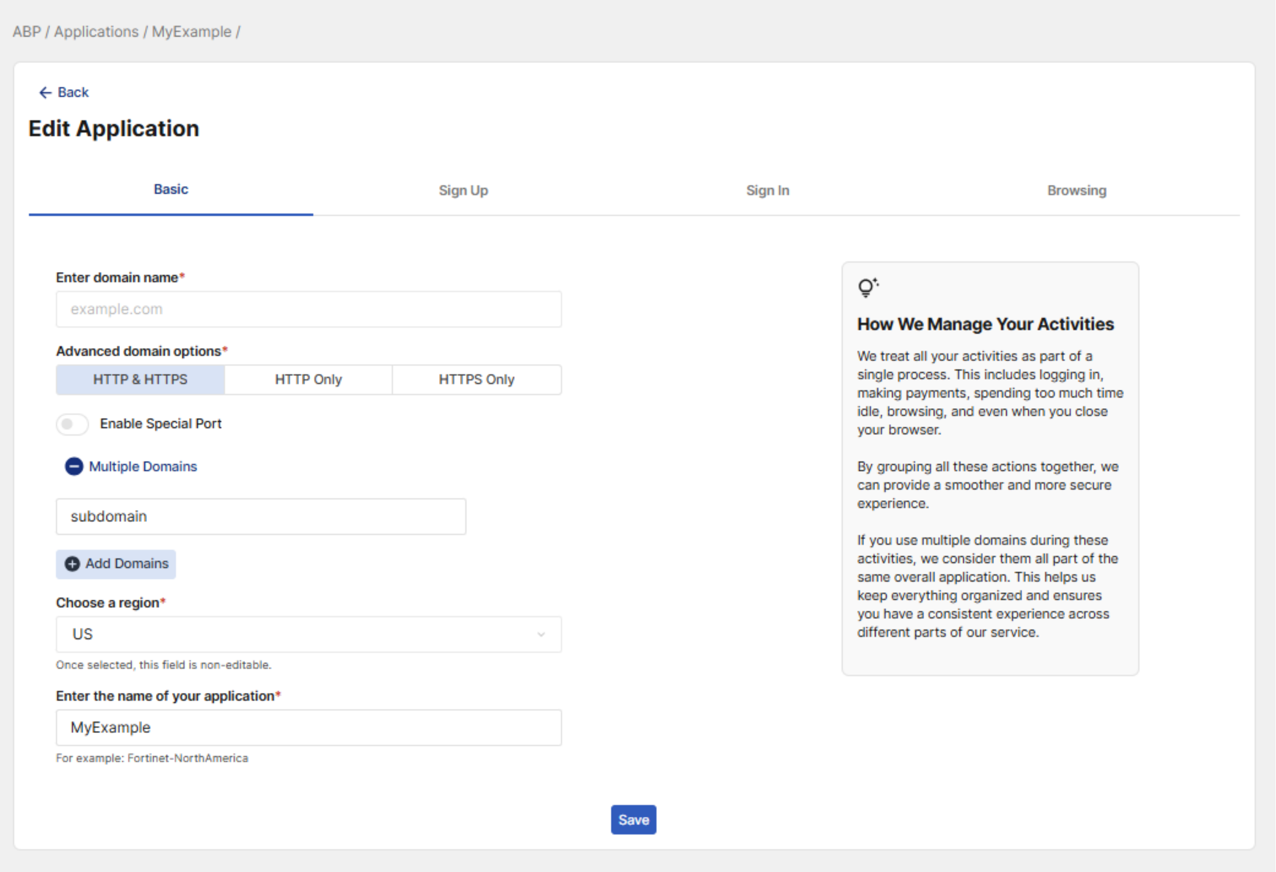
Please note that manually entering URL entries through FortiAppSec Cloud is not supported. If you wish to protect additional URLs, visit the Support site (https://support.fortinet.com) and submit a ticket.

If you are using ABP in tandem with FortiWeb or FortiADC, please see Integrating ABP into Fortinet Fabric Security for additional information.

Edit Application

1. Find the row containing the preferred application name and select the three dots in the Action column.
2. Click **Edit** to open the **Edit Application** wizard. The pages in this wizard contain the same fields as the **Create**

Application wizard. Please note, the domain name cannot be edited.



ABP / Applications / MyExample /

← Back

Edit Application

Basic | Sign Up | Sign In | Browsing

Enter domain name*

example.com

Advanced domain options*

HTTP & HTTPS | HTTP Only | HTTPS Only

Enable Special Port

Multiple Domains

subdomain

Add Domains

Choose a region*

US

Once selected, this field is non-editable.

Enter the name of your application*

MyExample

For example: Fortinet-NorthAmerica

Save

How We Manage Your Activities

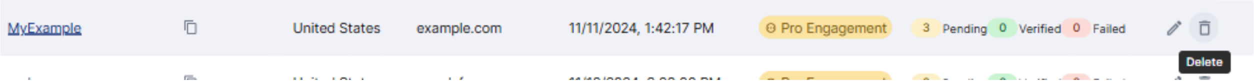
We treat all your activities as part of a single process. This includes logging in, making payments, spending too much time idle, browsing, and even when you close your browser.

By grouping all these actions together, we can provide a smoother and more secure experience.

If you use multiple domains during these activities, we consider them all part of the same overall application. This helps us keep everything organized and ensures you have a consistent experience across different parts of our service.

Delete Application

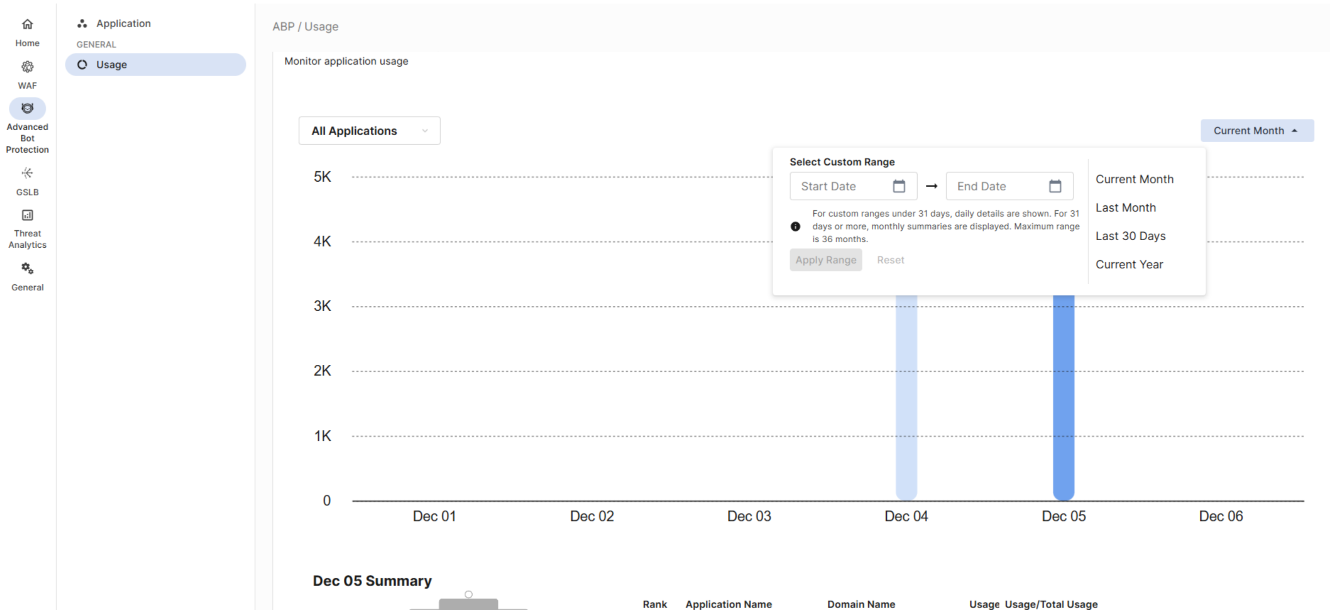
1. Find the row containing the preferred application name and select the three dots in the Action column.
2. Click **Delete**.



MyExample	United States	example.com	11/11/2024, 1:42:17 PM	Pro Engagement	3 Pending 0 Verified 0 Failed	Delete

Usage

Select one or all applications and date range to view its usage details on the **Usage** tab.



For custom ranges under 31 days, daily details are shown. For 31 days or more, monthly summaries are displayed. Maximum range is 36 months.

This page includes the following components:

- A bar graph showing the month-over-month number of requests protected by Advanced Bot Protection for the selected application(s) over the chosen time period.
  - Hover over a bar to see the number of protected requests for the selected month.
  - Click on a bar to change the other components on this page to reflect the data in the selected month.
- **Total Usage**: the total number of protected requests for the selected application(s) within a pie chart showing the total usage for the month compared to the total capacity purchased in the contract.
  - Click **View Details** to see the request usage breakdown between each license for the selected month.
- A ranked table displaying the percentage of selected application(s) usage compared to the total usage for the month.

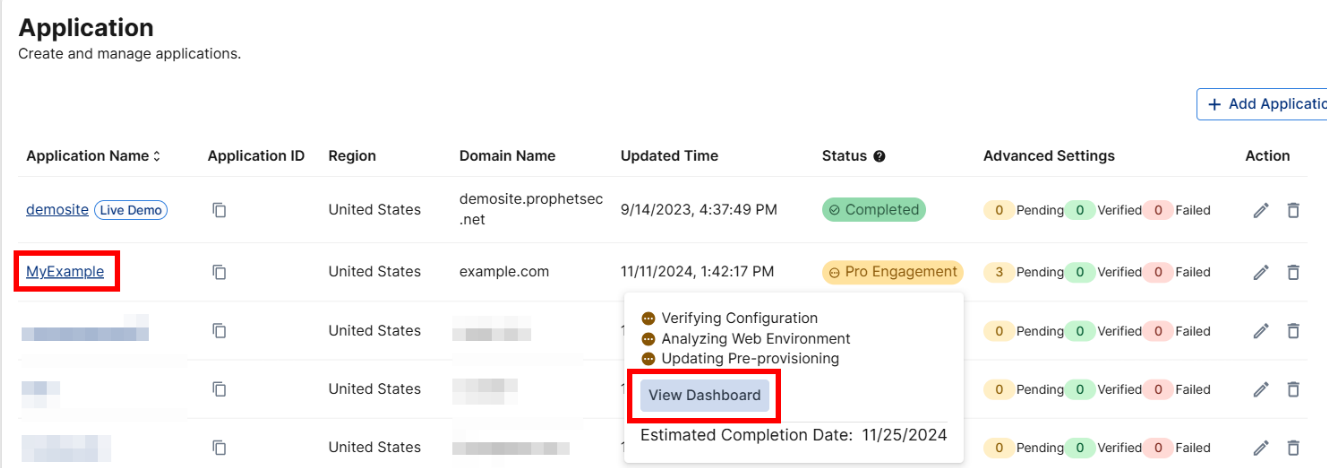
Traffic Insights

Traffic Insights is composed of different pages dedicated to helping you monitor the traffic activity on each application effectively.

This section covers the following:

- Dashboard on page 232
- Transactions on page 235
- Account Monitor on page 238
- Bot Monitor on page 239
- Exploration on page 241

To access these pages, go to **ABP > Application** and click on the desired **Application Name**, or click on the desired application's **Status** and click **View Dashboard**.



Application

Create and manage applications.

+ Add Applicatic

Application Name	Application ID	Region	Domain Name	Updated Time	Status	Advanced Settings	Action
demosite Live Demo		United States	demosite.prophetsec.net	9/14/2023, 4:37:49 PM	Completed	0 Pending 0 Verified 0 Failed	
MyExample		United States	example.com	11/11/2024, 1:42:17 PM	Pro Engagement	3 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]			0 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	1		0 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	1		0 Pending 0 Verified 0 Failed	

Verifying Configuration
Analyzing Web Environment
Updating Pre-provisioning

View Dashboard

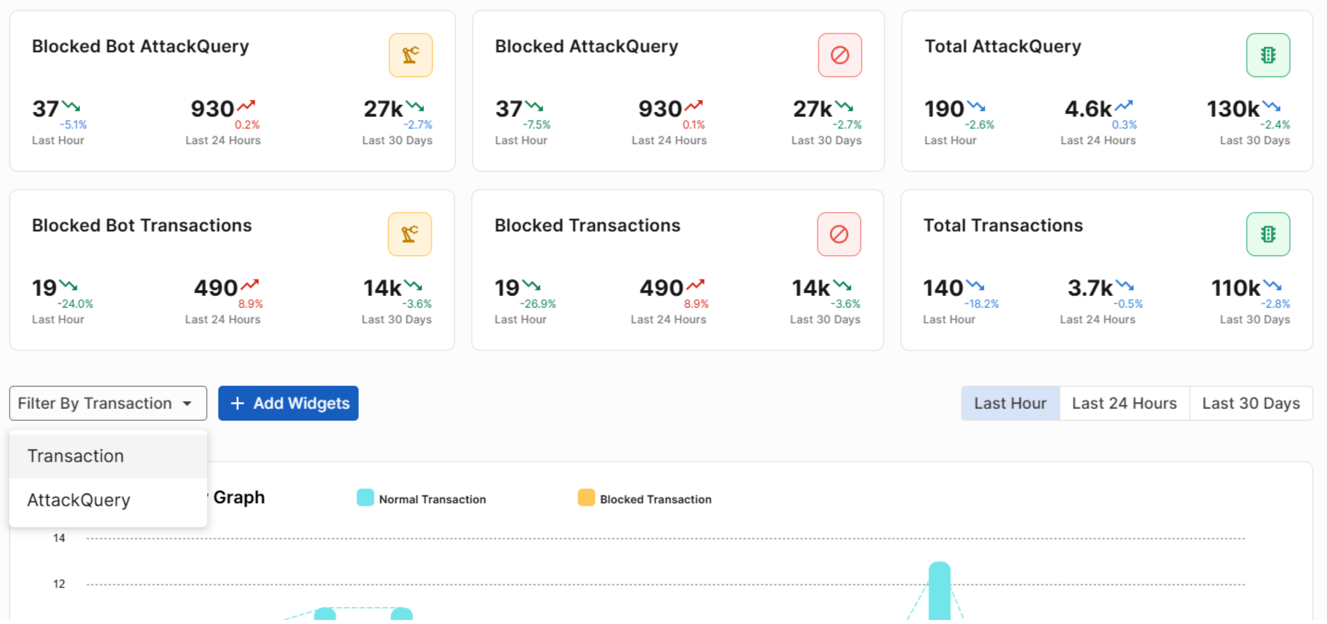
Estimated Completion Date: 11/25/2024

Dashboard

Extract valuable insights using tables and summary graphs that depict your application's traffic data.

Static Components

These components are fixed to your dashboard and cannot be edited or removed.



Blocked Bot AttackQuery
37 -5.1% Last Hour | 930 0.2% Last 24 Hours | 27k -2.7% Last 30 Days

Blocked AttackQuery
37 -7.5% Last Hour | 930 0.1% Last 24 Hours | 27k -2.7% Last 30 Days

Total AttackQuery
190 -2.6% Last Hour | 4.6k 0.3% Last 24 Hours | 130k -2.4% Last 30 Days

Blocked Bot Transactions
19 -24.0% Last Hour | 490 8.9% Last 24 Hours | 14k -3.6% Last 30 Days

Blocked Transactions
19 -26.9% Last Hour | 490 8.9% Last 24 Hours | 14k -3.6% Last 30 Days

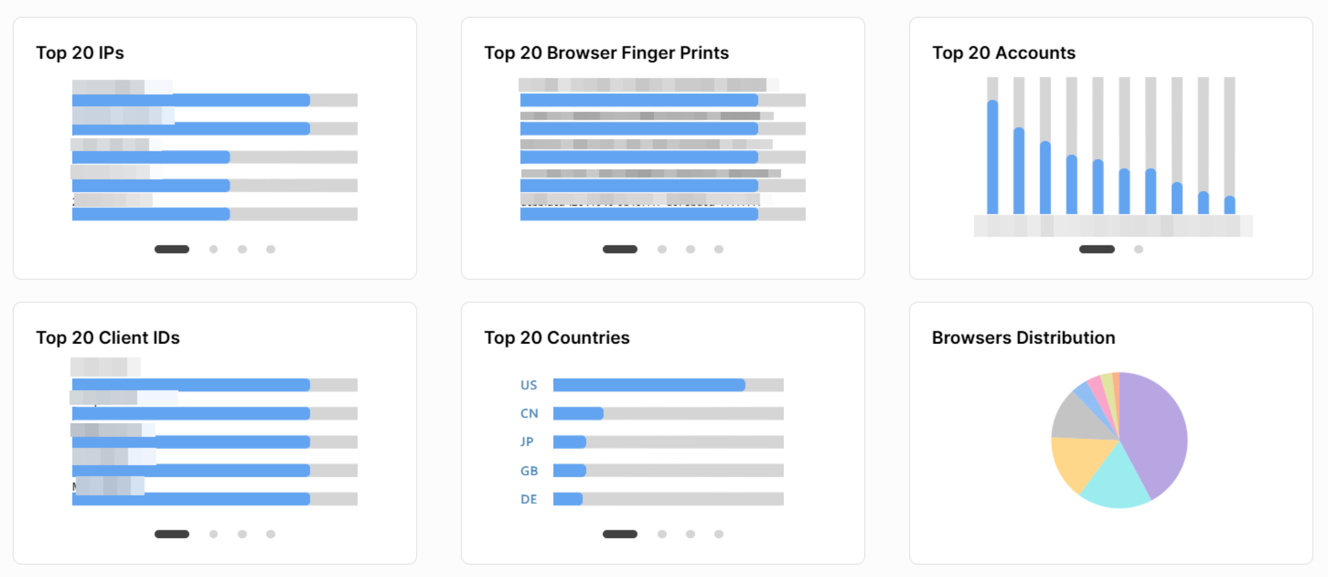
Total Transactions
140 -18.2% Last Hour | 3.7k -0.5% Last 24 Hours | 110k -2.8% Last 30 Days

Static Component	Description
AttackQuery Count	The count of Blocked Bot AttackQueries, Blocked AttackQueries, and Total AttackQueries over the past hour, 24 hours, and 30 days. • **Total AttackQuery:** The number of queries exchanged between the ABP device and a FortiADC/FortiWeb device regarding user activity on the protected application.

Static Component	Description
	• **Blocked AttackQuery:** The number of times ABP suggested FortiADC/ FortiWeb/ WAF to block the action detailed in the AttackQuery. • **Blocked Bot AttackQuery:** The number of times ABP suggested FortiADC/ FortiWeb/ WAF to block the action detailed in the AttackQuery, due to detected malicious bot behavior.
Transactions Count	The count of Blocked Bot Transactions, Blocked Transactions, and Total Transactions over the past hour, 24 hours, and 30 days. • **Total Transactions:** Count of actions performed by users within your application, including logging in, completing payments, periods of inactivity, browsing behavior, and closing the browser. These activities may be initiated by either humans or bots, and characteristics of the transaction can aid in distinguishing between human and bot interactions. • **Blocked Transactions:** Transactions blocked by ABP • **Blocked Bot Transactions:** Transactions blocked by ABP due to bot activity. For more details, see Transactions on page 235
History bar graph	Click on the **Filter By** button to choose the data displayed in the graph. • **Transactions History:** Shows the number of regular and blocked transactions over the given time frame. • **AttackQuery History:** Shows the number of regular and blocked attack queries over the given time frame. Adjust the time range displayed on the graph by clicking the buttons labeled "last hour," "last 24 hours," and "last 30 days" above the chart.
Top Account List Under Threat	List displaying users of your applications ranked from the highest risk score to the lowest. Click on the username to access the account monitoring page for each user.

Widgets

Customize your dashboard by using widgets to display more information. Widgets present the chosen data in either bar or pie charts and when selected, are positioned between **Transactions History Graph** and **Top Account List Under Threat**. Hover your cursor over the charts to view the count associated with each bar or pie slice.



How to add widgets to your dashboard

1. Navigate to **TRAFFIC INSIGHTS > Dashboard**
2. Click the **Widgets** button located above the Transactions History Graph. This opens a drop-down menu.
3. Select the widget option(s) you would like displayed on your dashboard.

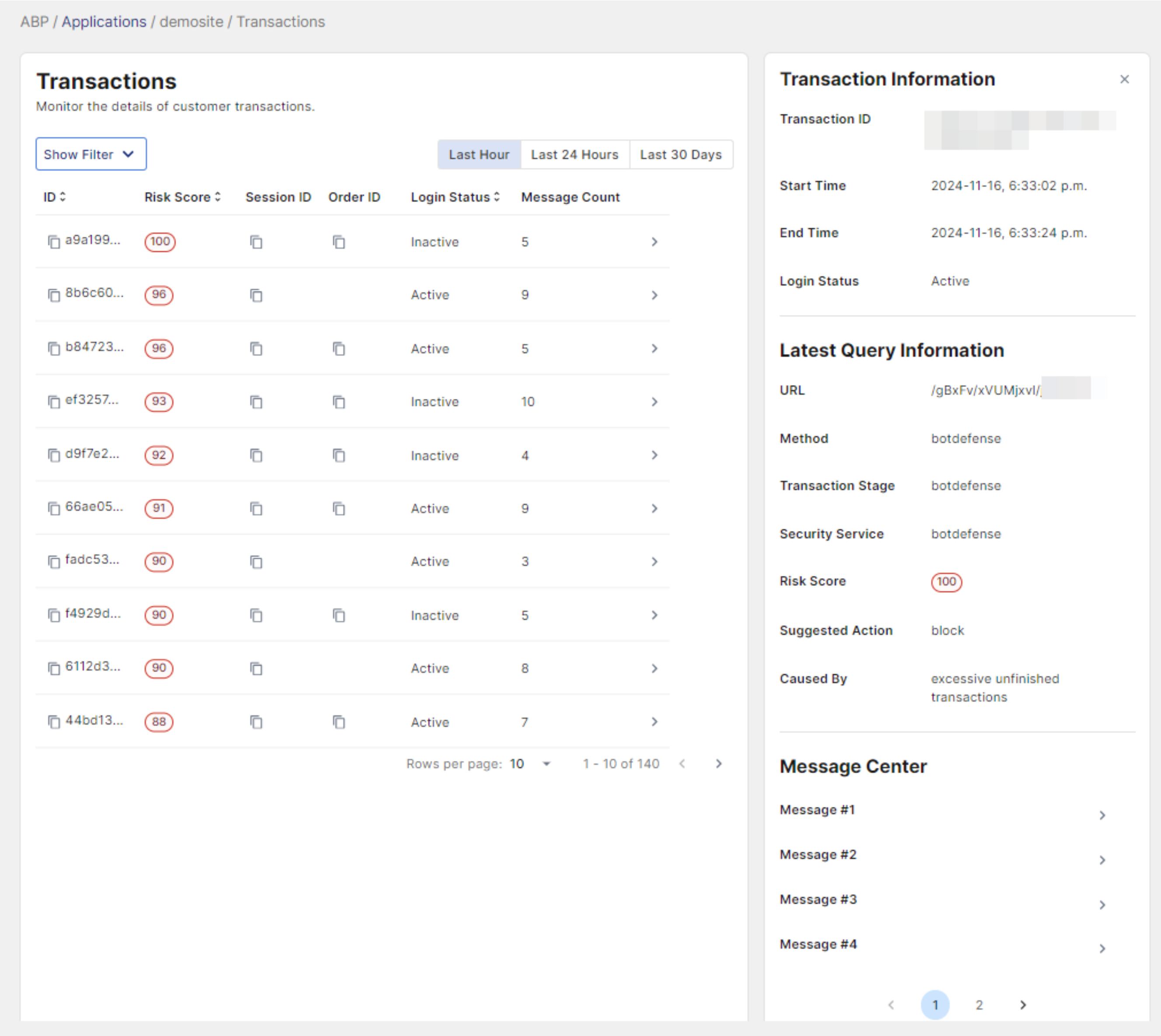
Widget name	Widget description
Top 20 IPs	20 IPs with the highest transaction counts.
Top 20 Browser Fingerprints	20 browser profiles with the highest transaction counts. Browser fingerprints identify repeat visitors to your website by cross-referencing various browser/device attributes. This includes crawler-specific attributes and browser/OS inconsistencies.
Top 20 Accounts	Usernames of 20 accounts with the highest transaction counts.
Top 20 Client ID	20 client IDs with the highest transaction counts. A client ID is a unique identifier for a user's web browser, generated from its configuration, including environment signals and HTTP transport layer information.
Top 20 Countries	20 countries with the highest transaction counts.
Browsers Distribution	Pie chart displaying the distribution of different browsers accessing your application. Hover over each pie slice to see the represented browser, along with the corresponding count (eg., Chrome: 58).
Top 20 UAs	20 user agents with the highest transaction counts.
OS Distribution	Pie chart illustrating the distribution of operating systems among devices accessing your application. Hover over each pie slice to see the represented operating system, along with the corresponding

Widget name	Widget description
	transaction count (e.g., Windows: 84).
Device Distribution	Pie chart illustrating the distribution of devices accessing your application. Hover over each pie slice to see the represented device type, along with the corresponding transaction count (e.g., Mac: 32).
Top 20 ASN	20 Autonomous System Numbers with the highest transaction counts.
Attacks Distribution	Pie chart illustrating the distribution of attacks on your application, as detected by FortiAppSec Cloud. Hover over each pie slice to see the represented attack type, along with the corresponding count (eg., Access from bad client: 2).
Top 20 Cities	20 cities with the highest transaction counts.
Top 20 Emails	The top 20 email addresses linked to the highest transaction counts.
Top 20 Phone Numbers	The top 20 phone numbers linked to the highest transaction counts.
Top 20 URLs	20 URLs on your application with the highest transaction counts.

Transactions

Transactions encompass all user activities within your application, such as login, payment outcomes, idle periods exceeding a specified duration, browsing, and browser closure.

The following attributes are displayed in **TRAFFIC INSIGHTS > Transactions**:



ABP / Applications / demosite / Transactions

Transactions

Monitor the details of customer transactions.

ID	Risk Score	Session ID	Order ID	Login Status	Message Count
a9a199...	100	⧉	⧉	Inactive	5
8b6c60...	96	⧉		Active	9
b84723...	96	⧉	⧉	Active	5
ef3257...	93	⧉	⧉	Inactive	10
d9f7e2...	92	⧉	⧉	Inactive	4
66ae05...	91	⧉	⧉	Active	9
fadc53...	90	⧉		Active	3
f4929d...	90	⧉	⧉	Inactive	5
6112d3...	90	⧉		Active	8
44bd13...	88	⧉	⧉	Active	7

Rows per page: 10 1 - 10 of 140

Transaction Information

Transaction ID	[redacted]
Start Time	2024-11-16, 6:33:02 p.m.
End Time	2024-11-16, 6:33:24 p.m.
Login Status	Active

Latest Query Information

URL	/gBxFv/xVUMjxvl/[redacted]
Method	botdefense
Transaction Stage	botdefense
Security Service	botdefense
Risk Score	100
Suggested Action	block
Caused By	excessive unfinished transactions

Message Center

Attribute	Description
Transaction ID	Each transaction is assigned a unique, randomly generated ID. You can click on the Transaction ID in the table to open a modal window with more details on the selected transaction. See Transaction Information on page 237.
Latest Risk Score	Risk scores can range from 0-100. Higher scores indicate more bot-like behavior, while lower scores suggest human-like activity. For more information on the factors that go into calculating the Risk Score, please see this page.
Start Time	The local date and time when the transaction begins.

Attribute	Description
End Time	The local date time when the transaction ends.
Login Status	Whether the transaction was performed by a logged-in user.
Session ID	The unique, randomly generated ID associated with the session in which the transaction took place. A session begins when a user begins accessing your application, and ends when the user closes the tab or browser.
Order ID	This value identifies payment-related transactions, and is empty for all non-payment transactions.
Messages	The number of telemetry messages transmitted in the transaction. You can click on this value in the table to open a modal window with more details on the selected transaction. See Transaction Information on page 237.

Click Show Filter to filter for Transaction ID, Session ID, Risk Score, OrderID, or Login Status.

You can also filter for transactions that took place in the last hour, last 24 hours, or last 30 days by clicking the corresponding buttons.

Transaction Information

Transaction Information opens as a modal window when you click on a **Transaction ID** or **Messages** value.

Under Transaction Information, you can find detailed information on the latest query and telemetry messages of the selected transaction.

- **Latest Query Information** details the final data request before the transaction ended, offering insights into the transaction's nature and potential completion or blockage causes.

Latest Query Attribute	Description
URL	The URL at which the latest query took place on your application's domain.
Method	The HTTP method behind the latest query.
Transaction Stage	Describes the stage at which the last query took place. This value may provide insight into the nature of the transaction.
Risk Score	Risk scores can range from 0-100. Higher scores indicate more bot-like behavior, while lower scores suggest human-like activity. For more information on the factors that go into calculating the Risk Score, please see Overview on page 194.
Security Service	This value is determined by the terms of your license.
Suggested Action	The response FortiAppSec Cloud recommends based on the risk score.
Caused by	A brief explanation behind **Suggested Action**.

- The numbered messages under **Message** can be expanded to reveal the following details on the telemetry messages sent in the selected transaction.

Message Attribute	Description
IP	The IP address from which the telemetry message was sent.
User Agent	A software component that identifies and provides information about the device or application sending the telemetry message.
Country	The message's detected country of origin.
City	The message's detected city of origin.
User Name	If the telemetry message was sent during a logged-in session, the username of the user is included in this field.
Email	If the telemetry message was sent during a logged-in session, the registered email of the user is included in this field.
Order ID	This value identifies payment-related transactions, and is empty for all non-payment transactions.
Payment ID	This value identifies payment-related transactions, and is empty for all non-payment transactions.
Session ID	This value identifies the session in which the message was sent.
URL	The URL on your application's domain at which the message was sent.

Account Monitor

Account Monitor aggregates the transaction information by individual accounts, and displays a risk score for each account. Accounts with risk score higher than 80 is considered as a bot.

The accounts are sorted by risk score. The one with the higher risk score will be ranked at top.

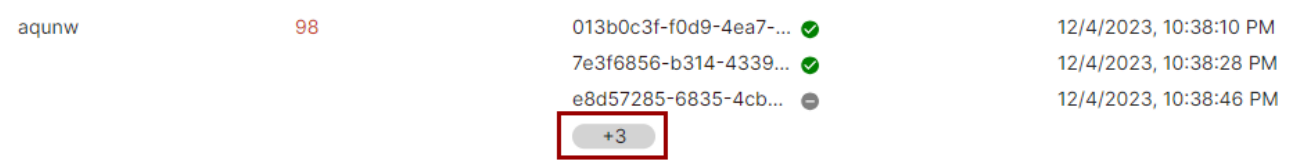
Filtering accounts

To tailor the displayed accounts according to specific criteria:

1. Go to **Traffic Insights > Account Monitor**.
2. Click **Show Filter**.
3. Enter values for **User name**, **Risk Score**, and **Transactions** to match the desired accounts.
4. Click **Apply Filters**.

Reading the transaction data of an account

All transactions associated with an account are visible in the **Transactions** column. Transactions exceeding three will be initially collapsed. To expand them, click the number icon at the bottom of each **Transaction** cell.



aqunw	98	013b0c3f-f0d9-4ea7-... ✓	12/4/2023, 10:38:10 PM
		7e3f6856-b314-4339... ✓	12/4/2023, 10:38:28 PM
		e8d57285-6835-4cb... ⊖	12/4/2023, 10:38:46 PM
		+3	

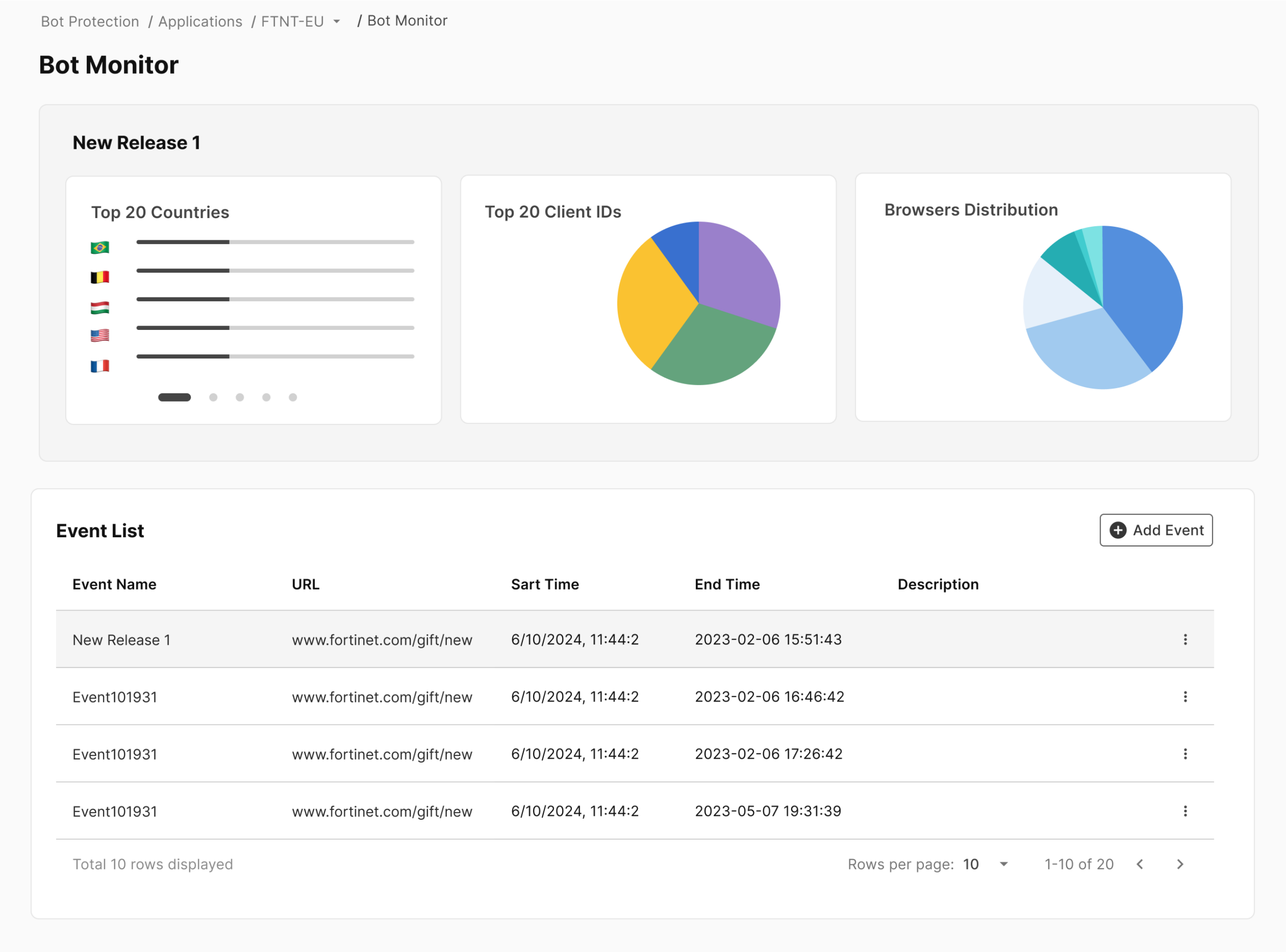
The transactions are marked with three Status:

✓ Allow	The transaction is legitimate and is advised to let go.
⊖ Unknown	There is enough data to rate this transaction.
⛔ Block	The transaction is suspicious and is highly considered from a bot.

To access detailed information about a transaction, click on it. For more instructions on how to interpret a specific transaction, see Transactions on page 235

Bot Monitor

Define special events and notable traffic patterns to create reports on your application's activity during specific time frames.



Event Name	URL	Sart Time	End Time	Description	
New Release 1	www.fortinet.com/gift/new	6/10/2024, 11:44:2	2023-02-06 15:51:43		⋮
Event101931	www.fortinet.com/gift/new	6/10/2024, 11:44:2	2023-02-06 16:46:42		⋮
Event101931	www.fortinet.com/gift/new	6/10/2024, 11:44:2	2023-02-06 17:26:42		⋮
Event101931	www.fortinet.com/gift/new	6/10/2024, 11:44:2	2023-05-07 19:31:39		⋮

Total 10 rows displayed

Rows per page: 10 ▾ 1-10 of 20 ‹ ›

Configure custom bot monitoring events:

1. Click **Event**.
2. Fill out the following fields:

Field	Description
Event Name	Name the event you would like to monitor (eg., product release day, New Year's Eve).
Start Time	Set the start time of the event
End Time	Optional; event is ongoing when empty.
URL	Optional; the URL(s) you would like to monitor. When empty, all of the URLs on your application's domain are monitored.
Description	Optional; enter a description that will help you keep track of the different events.

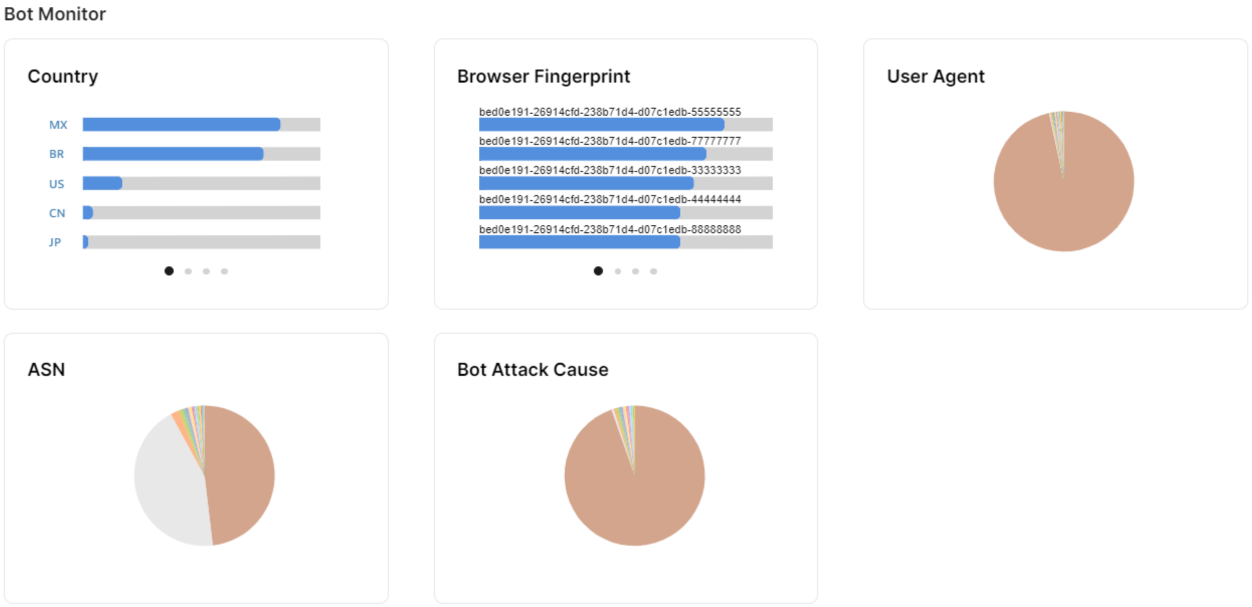
Bot Monitor

After you have defined events to monitor, FortiAppSec Cloud will populate bar and pie charts that describe the detected bots.

The Bot Monitor charts illustrate the following:

- Country
- Browser Fingerprint
- User Agent
- ASN
- Bot Attack Cause

Hover your cursor over the charts to view the count associated with each bar or pie slice.


Bot Monitor
Country
MX
BR
US
CN
JP
Browser Fingerprint
bed0e191-26914cfd-238b71d4-d07c1edb-55555555
bed0e191-26914cfd-238b71d4-d07c1edb-77777777
bed0e191-26914cfd-238b71d4-d07c1edb-33333333
bed0e191-26914cfd-238b71d4-d07c1edb-44444444
bed0e191-26914cfd-238b71d4-d07c1edb-88888888
User Agent
ASN
Bot Attack Cause

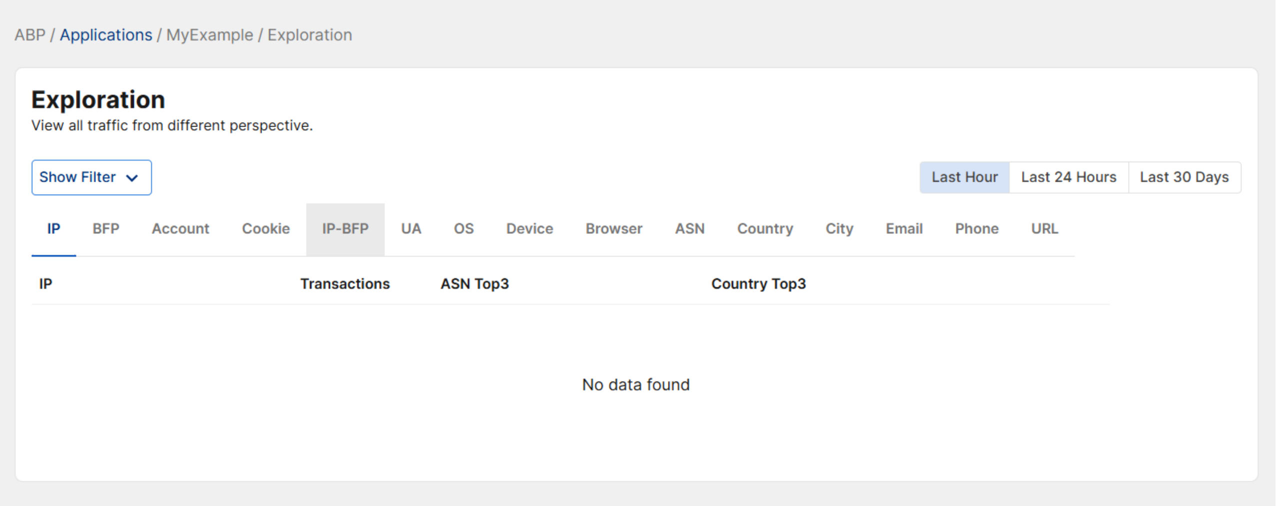
Exploration

View traffic by common characteristics such as IP, User Agent, countries, etc.

To tailor the displayed accounts according to specific criteria:

1. Go to **Traffic Insights > Exploration**.
2. Click **Show Filter**.
3. Enter values for the criteria that you want to use to match certain traffic.

4. Click **Apply Filters**.



ABP / Applications / MyExample / Exploration

Exploration

View all traffic from different perspective.

IP	Transactions	ASN Top3	Country Top3

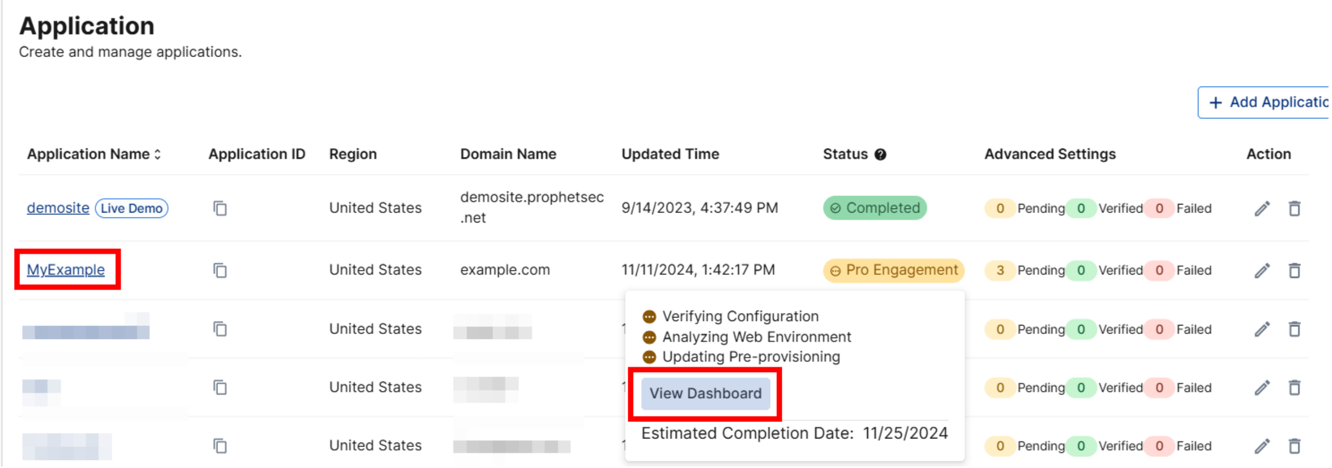
No data found

Configurations

This section includes the following pages:

- Signals on page 242
- Pre-Provisioning on page 243
- Connectors on page 245

To access these pages, go to **ABP > Application** and click on the desired **Application Name**, or click on the desired application's **Status** and click **View Dashboard**.



Application

Create and manage applications.

Application Name	Application ID	Region	Domain Name	Updated Time	Status	Advanced Settings	Action
demosite Live Demo		United States	demosite.prophetsec.net	9/14/2023, 4:37:49 PM	Completed	0 Pending 0 Verified 0 Failed	
MyExample		United States	example.com	11/11/2024, 1:42:17 PM	Pro Engagement	3 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	1		0 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	1		0 Pending 0 Verified 0 Failed	
[redacted]		United States	[redacted]	1		0 Pending 0 Verified 0 Failed	

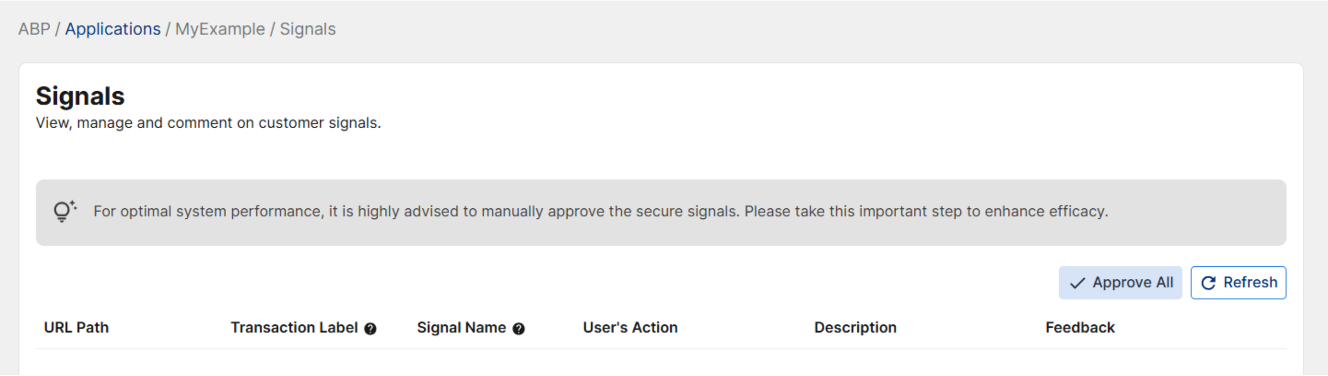
Verifying Configuration
Analyzing Web Environment
Updating Pre-provisioning

Estimated Completion Date: 11/25/2024

Signals

Detecting bot behaviors often relies on analyzing common characteristics such as IP addresses, User Agents, and mouse movements. However, uncovering more sophisticated bot activities requires additional insights, such as identifying patterns like rapid order placement across widely dispersed shipping addresses or unusually low transaction amounts (e.g., less than one cent).

To enable such advanced detection, you must authorize the system to collect data based on enhanced bot evaluation dimensions. This is essential for building a more comprehensive detection model capable of identifying deeply concealed bot activities.



ABP / Applications / MyExample / Signals

Signals

View, manage and comment on customer signals.

For optimal system performance, it is highly advised to manually approve the secure signals. Please take this important step to enhance efficacy.

URL Path	Transaction Label	Signal Name	User's Action	Description	Feedback

1. Go to the **Signals** page.
2. Locate the relevant URL path and the corresponding activities (Signal Name).
3. Click the **Approve** button to authorize the collection of additional data, enhancing the accuracy of bot detection. If you have concerns on collecting such data, please click **Comment** to explain your concern to FortiAppSec Cloud team.

Pre-Provisioning

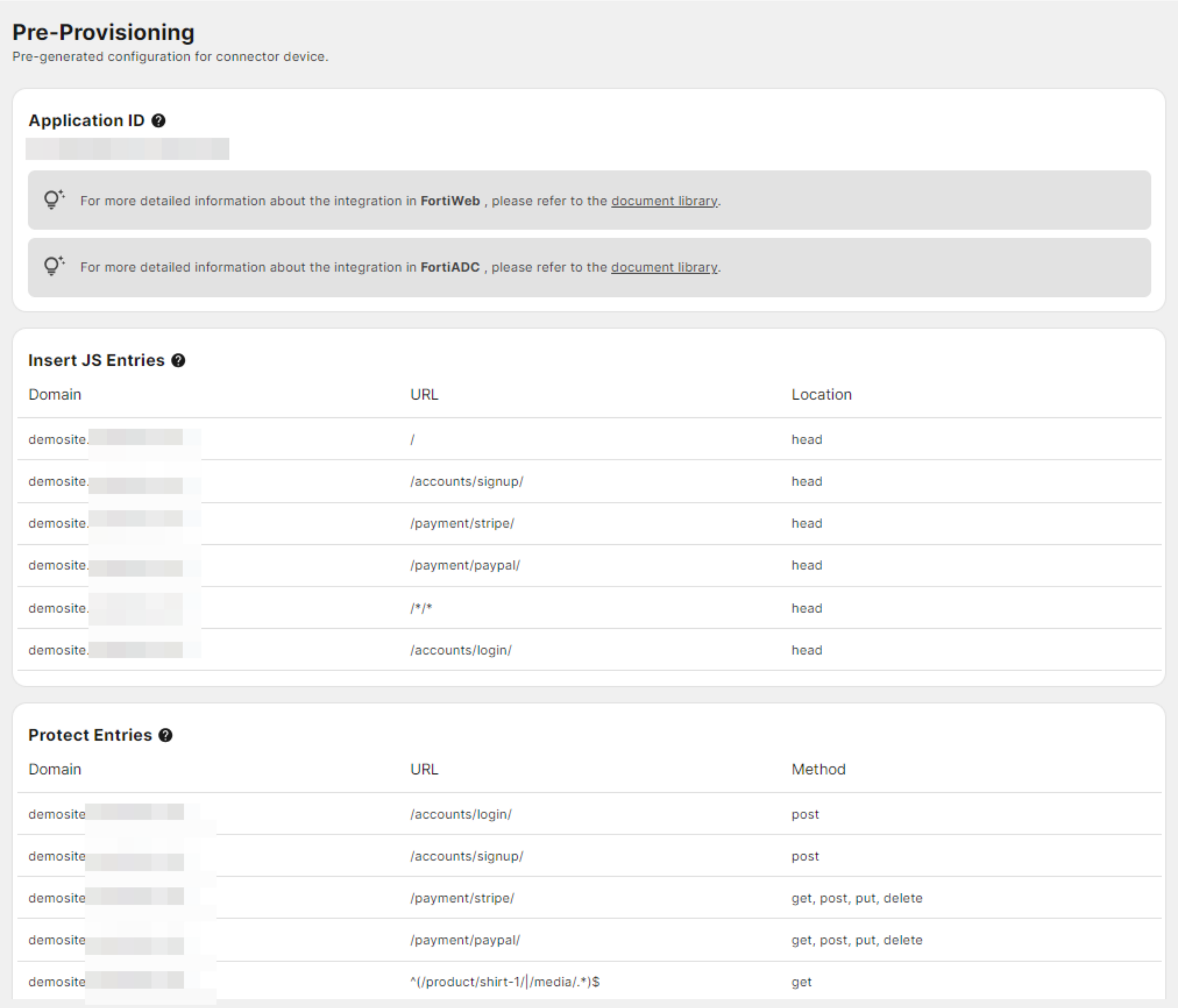
The **Pre-Provisioning** page contains the analyzed resources required to protect your application, which includes the protected URL entries and the locations where JavaScript is inserted through your connector devices to collect client information for bot detection.

The Pre-Provisioning process begins once you have added an Application. This triggers a request to the Professional Engagement Team (PET) to analyze your application details and to identify URLs to protect and the locations to which JavaScript need to be inserted to collect client information. The connector device will then use these Pre-Provisioned resources to apply Advanced Bot Protection to your Application traffic.

If you would like more information on the PET process, please refer to Pre-Provisioning Application resources on page 210.

The Pre-Provisioning process is currently conducted internally by the PET and requires 2 to 3 days to complete. If you wish to modify or add entries, please submit a request with Fortinet Support.

When Pre-Provisioning is complete, you can access the information on the protected URL entries and the locations where JavaScript is inserted for bot protection from the **Pre-Provisioning** page.



Pre-Provisioning

Pre-generated configuration for connector device.

Application ID

[redacted]

For more detailed information about the integration in **FortiWeb** , please refer to the document library.

For more detailed information about the integration in **FortiADC** , please refer to the document library.

Insert JS Entries

Domain	URL	Location
demosite.[redacted]	/	head
demosite.[redacted]	/accounts/signup/	head
demosite.[redacted]	/payment/stripe/	head
demosite.[redacted]	/payment/paypal/	head
demosite.[redacted]	/*/*	head
demosite.[redacted]	/accounts/login/	head

Protect Entries

Domain	URL	Method
demosite[redacted]	/accounts/login/	post
demosite[redacted]	/accounts/signup/	post
demosite[redacted]	/payment/stripe/	get, post, put, delete
demosite[redacted]	/payment/paypal/	get, post, put, delete
demosite[redacted]	^(/product/shirt-1/|/media/.*)$	get

Insert JS Entries

The **Insert JS Entries** table lists all the locations ABP has identified in your Application domain that should be inserted with the JavaScript to collect client information.

Parameter	Description
Domain	Domain of the ABP Application to be protected.
URL	The URL path identified from the Application domain.
Location	The location in the HTTP response where the connector device will inject the JavaScript to collect client information.

Protect Entries

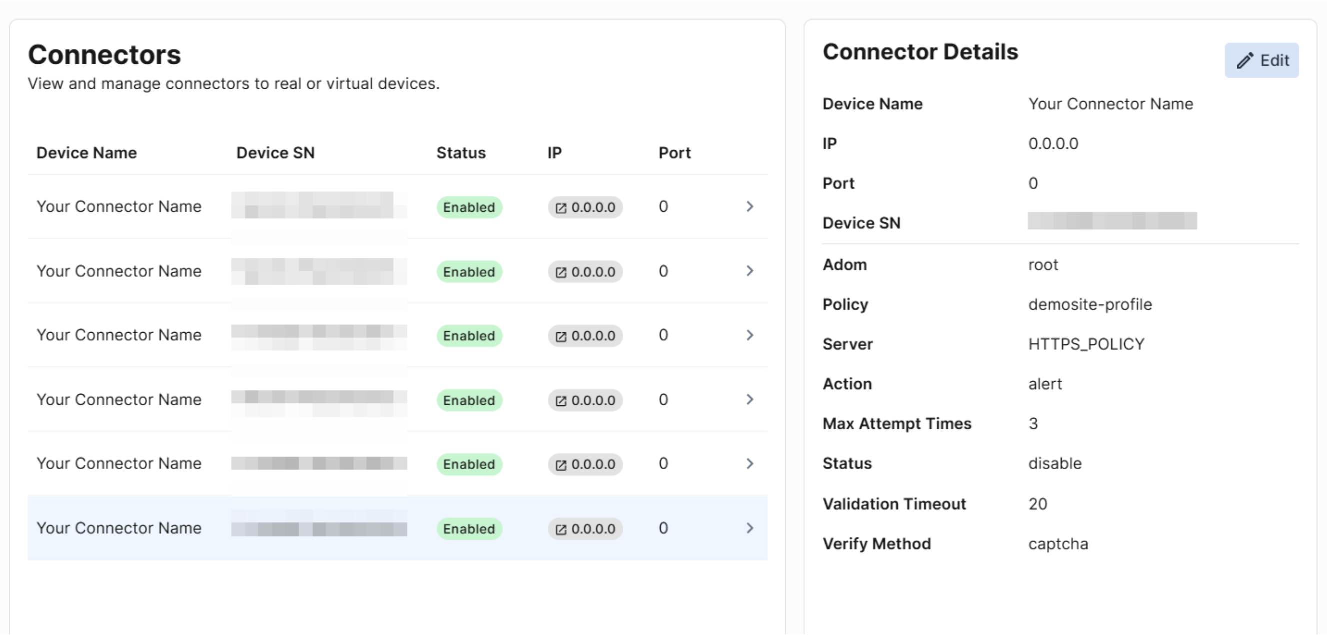
The **Protect Entries** table lists all the URL paths under your Application domain that ABP has identified should be protected.

Parameter	Description
Domain	Domain of the ABP Application to be protected.
URL	The URL path identified from the Application domain.
Method	HTTP requests using any of the listed methods in the protected URL will initiate the attack query to the Advanced Bot Protection Cloud Service.

Connectors

From the **Connectors** page, you can view the Fabric devices connected to FortiAppSec Cloud. This page contains details of each connector device, including their device serial number, IP address, port number, and more.

In rare troubleshooting scenarios when ABP does not correctly fetch the device IP or Port, you may edit these fields. However, this does not affect the connection of ABP to the connector device.



Connectors

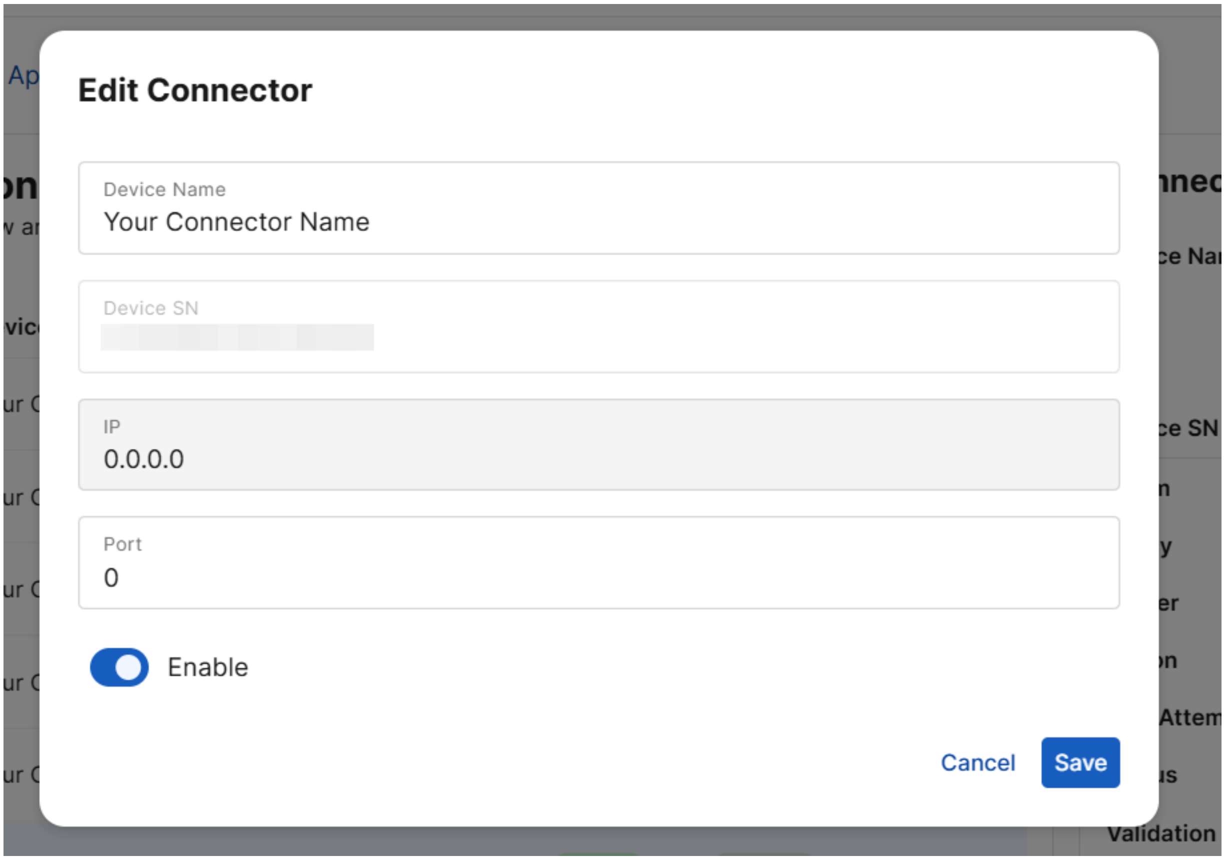
View and manage connectors to real or virtual devices.

Device Name	Device SN	Status	IP	Port
Your Connector Name	[redacted]	Enabled	0.0.0.0	0
Your Connector Name	[redacted]	Enabled	0.0.0.0	0
Your Connector Name	[redacted]	Enabled	0.0.0.0	0
Your Connector Name	[redacted]	Enabled	0.0.0.0	0
Your Connector Name	[redacted]	Enabled	0.0.0.0	0
Your Connector Name	[redacted]	Enabled	0.0.0.0	0

Connector Details

Device Name	Your Connector Name
IP	0.0.0.0
Port	0
Device SN	[redacted]
Adom	root
Policy	demosite-profile
Server	HTTPS_POLICY
Action	alert
Max Attempt Times	3
Status	disable
Validation Timeout	20
Verify Method	captcha

You can edit connectors by selecting a connector in the list on the left, then clicking **Edit** under **Connector Details**.



Edit Connector

Device Name: Your Connector Name

Device SN: [redacted]

IP: 0.0.0.0

Port: 0

Enable

GSLB

Global Server Load Balancing (GSLB) is a DNS-based traffic management solution that ensures high availability and performance by distributing user requests across multiple servers or data centers globally. It provides redundancy and resilience, automatically directing traffic to the most optimal or available resources when a local deployment experiences unexpected downtime, spikes, or other disruptions.

The GSLB objects are designed by the physical and logical components on the network.

The physical components of the network include:

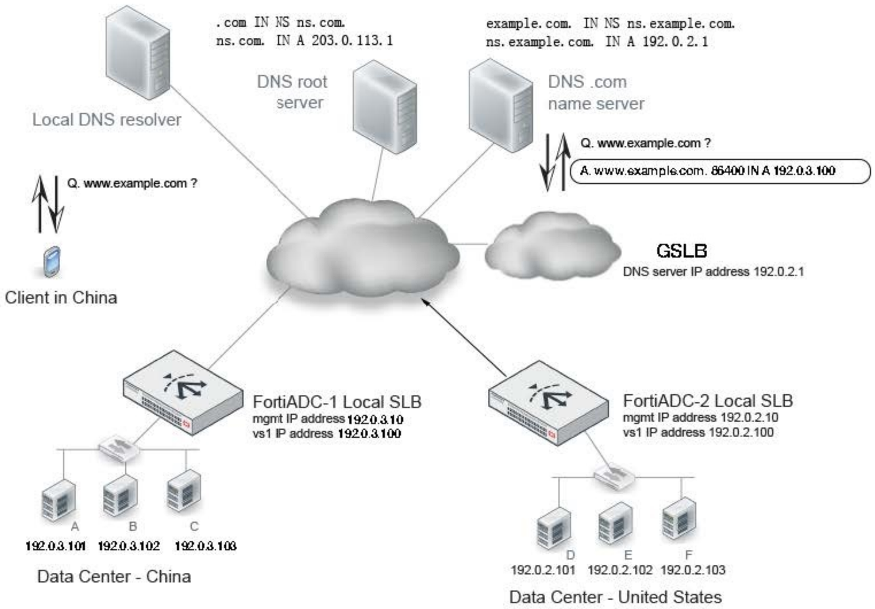
- Data Center: Represents a physical data center where servers are located.
- Server: Refers to the physical machines in the data center.
- Location: A grouping of geographic areas that may contain multiple data centers or servers.

The logical components of the network include:

- Virtual Server Pool: Represents a collection of virtual servers that distribute and manage traffic logically.
- FQDN Connector: Maps a fully-qualified domain name (FQDN) to a set of virtual servers for handling requests.

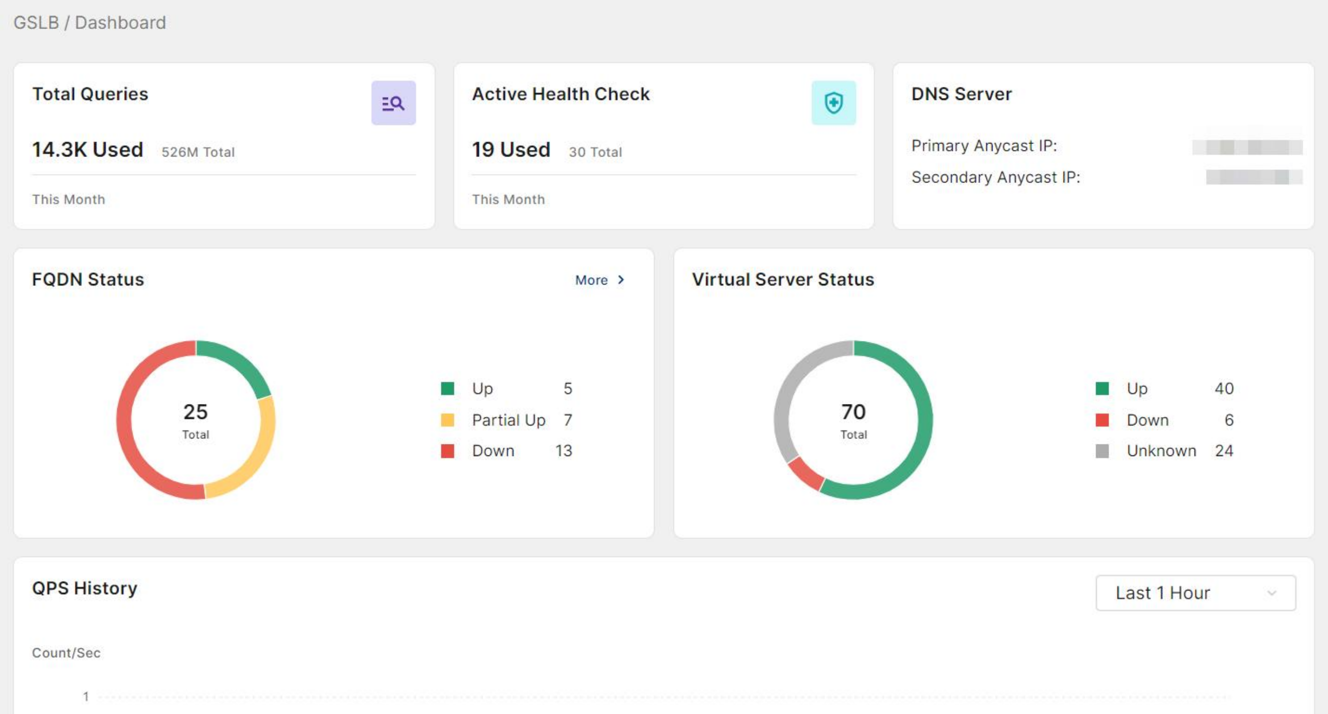
Mappings:

- The object data center corresponds to the physical data center.
- The object fabric connector relates to physical devices like FortiADC.
- The object location organizes geographical regions.
- The object pool represents a set of virtual servers.
- The object FQDN links a fully-qualified domain name to the virtual server pool for routing traffic.



GSLB Dashboard

The GSLB Dashboard provides real-time metrics on total queries, query per second (QPS) rates, load balancer health checks, fully qualified domain name (FQDN) status, and virtual server operational status.



GSLB / Dashboard

Total Queries

14.3K Used 526M Total

This Month

Active Health Check

19 Used 30 Total

This Month

DNS Server

Primary Anycast IP: [redacted]

Secondary Anycast IP: [redacted]

FQDN Status

More ›

🟩	Up	5
🟨	Partial Up	7
🟥	Down	13

Virtual Server Status

🟩	Up	40
🟥	Down	6
⬜	Unknown	24

QPS History

Last 1 Hour

Total Queries	Total queries used by the account; total capacity in the current month.
Active health check	Active health check used by the account; total capacity in the current month.
Queries per second (QPS)	Queries per second currently
FQDN status	Shows the status of the FQDN. Red is down; yellow is partially up; green is completely up.
Virtual server status	Shows the status of virtual servers. There are three statuses: up, down, and unknown.
Licenses	Licenses and capacity status of this account

For comprehensive details regarding the functionalities within the GSLB services WebUI and its various pages, please see Service on page 269

Onboarding GSLB Applications

There are two ways to set up GSLB for your Application:

1. Topology Page: Set up GSLB settings in a more visual way, via Topology on page 267
2. Manual Configuration: Follow the steps below
    a. Configuring GSLB Objects on page 255 - This step entails setting up configurations within the FortiAppSec Cloud portal.
    b. Linking GSLB to domain register on page 249 - Once your application is configured on the FortiAppSec Cloud portal, this section demonstrates methods to implement your changes on the internet.

For those migrating a domain from another vendor to GSLB, it is crucial to configure the object on GSLB first. Otherwise, your domain could be temporarily out of service.

If you are setting up a brand new domain, the sequence of steps does not affect functionality.

Linking GSLB to domain register

To leverage FortiAppSec Cloud's load balancing capabilities, you need to point your domain's name server to your FortiAppSec Cloud GSLB service. Configuring GSLB Objects on page 255

This section covers the following:

- General Procedures for directing your domain's name server to GSLB on page 249
- Configuration Examples on page 250
    - Modifying your domain registration with AWS Route 53 on page 250
    - Configuring a New GSLB Application: Network Solutions Use Case Example on page 252

General Procedures for directing your domain's name server to GSLB

For those migrating a domain from another vendor to GSLB, it is crucial to configure the object on GSLB before performing the steps on this page to avoid any temporary service interruptions.

If you are setting up a brand new domain, the sequence of steps does not affect functionality.

We recommend performing the following optional steps prior to setting up your domain:

1. Navigate to **GSLB > DNS** within the FortiAppSec Cloud GUI, and click the edit icon in the row of the desired application.
2. Ensure that the “Domain Name,” “Primary Server Name,” and “Primary Server Address matches the one on FortiAppSec Cloud.
3. It's recommended to set the “Primary Server Address” to match the assigned DNS Server IP.

These steps are recommended but not mandatory. If you skip these steps, GSLB will use default values for the domain settings.

Set Name Servers and Glue Records via Web Host:

1. `dig` from FortiAppSec Cloud to see your application's SOA records. Take note of your Name Severs and Glue Records.
2. Access your web host's settings.
3. Set the Name Servers and Glue Records using the SOA records directly provided by GSLB.

Note: Changes to name servers may take time to propagate globally. The name server (NS) is specified in the Start of Authority (SOA) record, while the glue records are the IP addresses linked to the NS records.

Configuration Examples

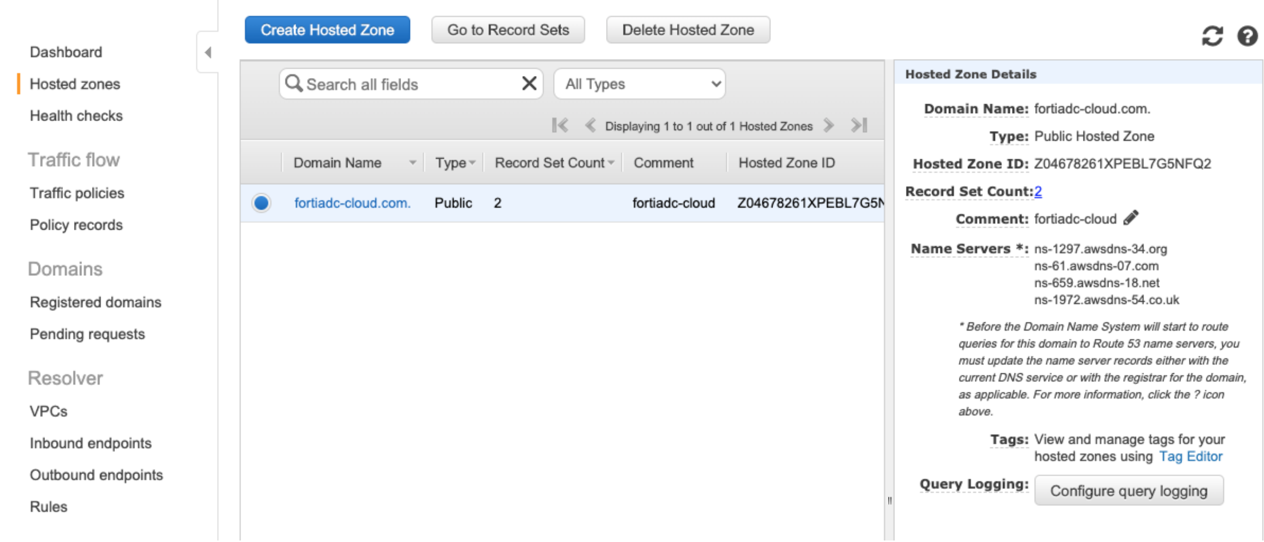
Typically, you can adjust your DNS records through your web host or the domain registrar from which you obtained your domain.

Here are procedures for AWS Route 53 and Network Solutions, both prominent domain registrars. However, keep in mind that other vendors like GoDaddy, Cloudflare, and local registrars may offer different processes.

Modifying your domain registration with AWS Route 53

Below is the procedure for users who have registered their domain names through AWS Route 53.

1. Sign in to the AWS Management Console.
2. Go to *Registered domains* and click your *Domain Name*. Route 53 will display details of the domain. Click on *Manage DNS*.



Domain Name	Type	Record Set Count	Comment	Hosted Zone ID
fortiadc-cloud.com.	Public	2	fortiadc-cloud	Z04678261XPEBL7G5N

Hosted Zone Details

Domain Name: fortiadc-cloud.com.

Type: Public Hosted Zone

Hosted Zone ID: Z04678261XPEBL7G5NFQ2

Record Set Count: 2

Comment: fortiadc-cloud

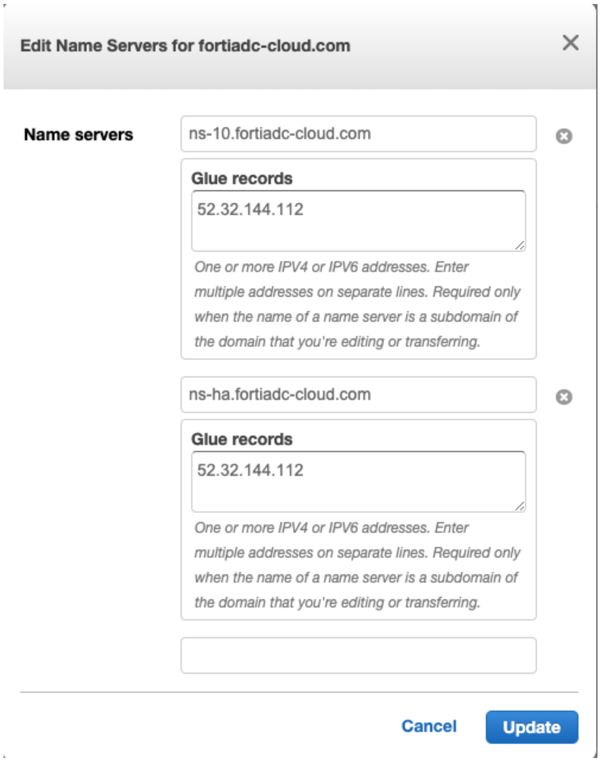
Name Servers *: ns-1297.awsdns-34.org
ns-61.awsdns-07.com
ns-659.awsdns-18.net
ns-1972.awsdns-54.co.uk

** Before the Domain Name System will start to route queries for this domain to Route 53 name servers, you must update the name server records either with the current DNS service or with the registrar for the domain, as applicable. For more information, click the ? icon above.*

Tags: View and manage tags for your hosted zones using Tag Editor

Query Logging: Configure query logging

3. Go to *Add or edit name servers* on the domain general information page. Set the Name servers and Glue records as SOA records directly taken from GSLB. Route 53 requires at least two name servers, so do not delete all other name servers.
   Note:Changes to Route 53 name servers may take time to propagate globally. The name server (NS) is specified in the Start of Authority (SOA) record, while the glue records are the IP addresses linked to the NS records.



Edit Name Servers for fortiadc-cloud.com

Name servers: ns-10.fortiadc-cloud.com

Glue records: 52.32.144.112

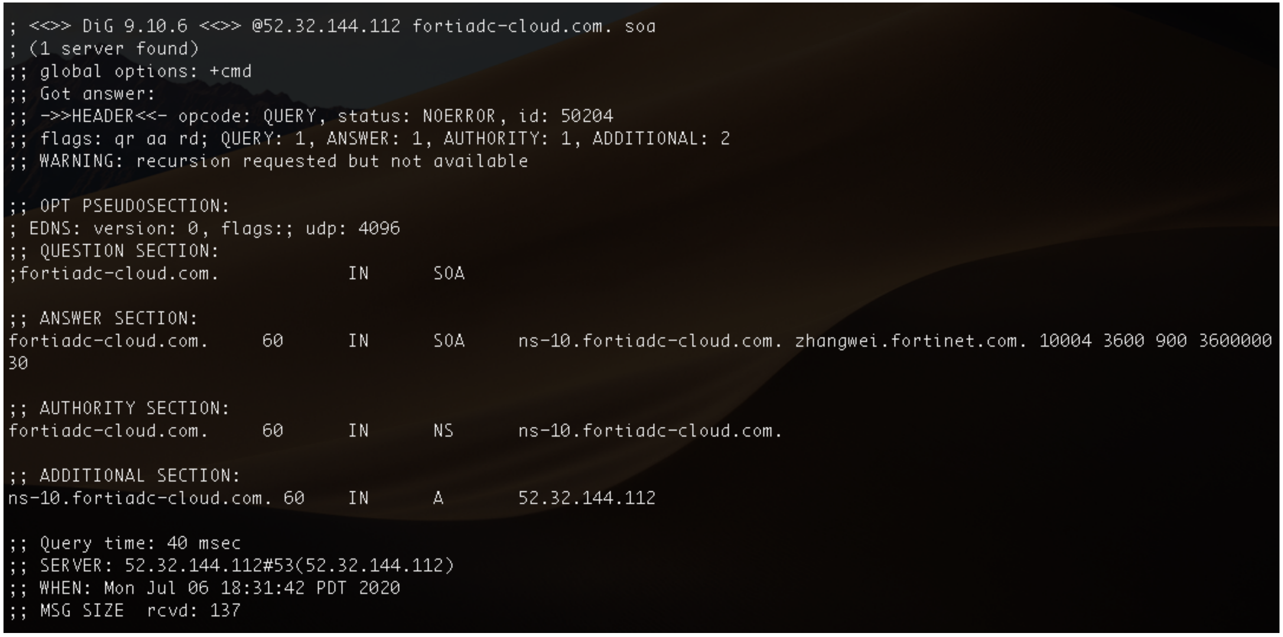
One or more IPV4 or IPV6 addresses. Enter multiple addresses on separate lines. Required only when the name of a name server is a subdomain of the domain that you're editing or transferring.

ns-ha.fortiadc-cloud.com

Glue records: 52.32.144.112

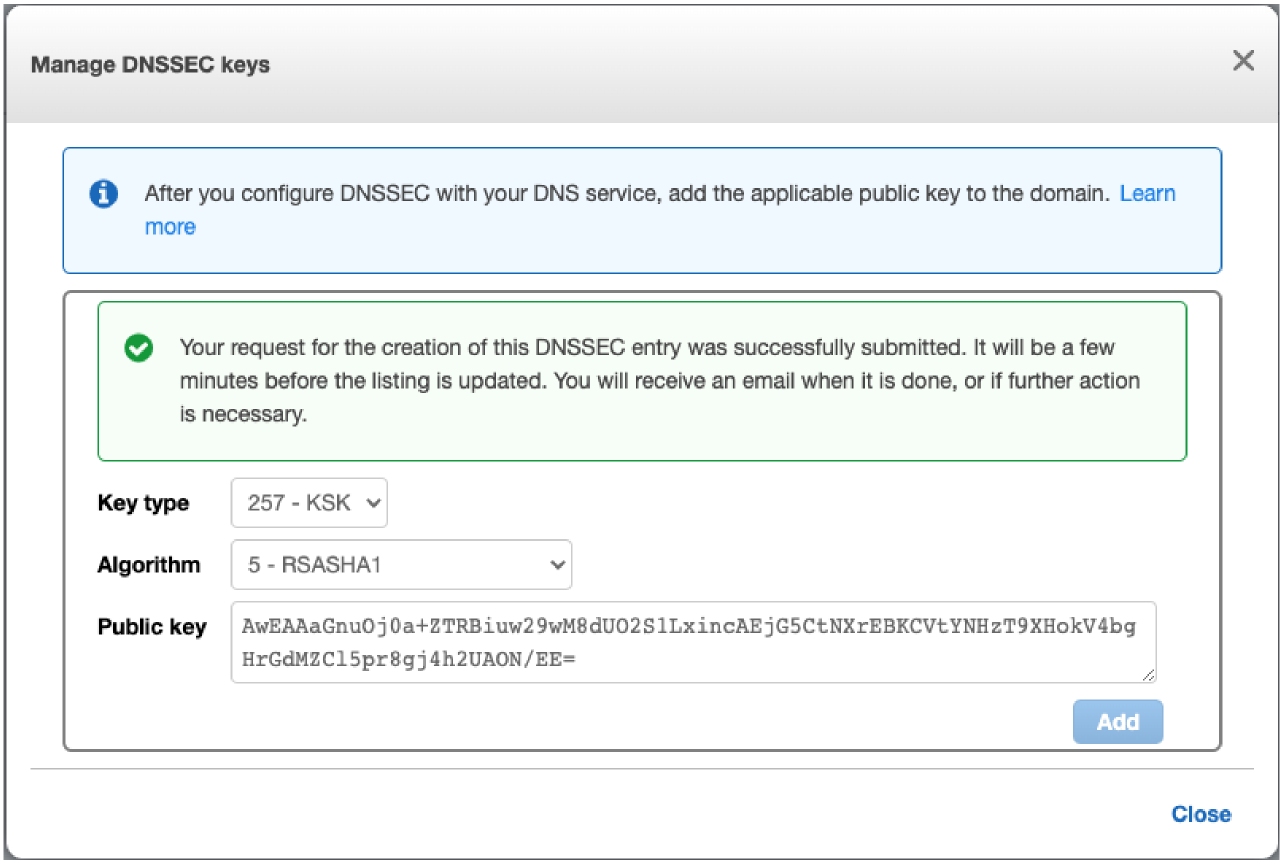
One or more IPV4 or IPV6 addresses. Enter multiple addresses on separate lines. Required only when the name of a name server is a subdomain of the domain that you're editing or transferring.

Your domain SOA records should look something like the following when you `dig` from GSLB directly.



```
; <<>> DiG 9.10.6 <<>> @52.32.144.112 fortiadc-cloud.com. soa
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 50204
;; flags: qr aa rd; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 2
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;fortiadc-cloud.com.            IN      SOA

;; ANSWER SECTION:
fortiadc-cloud.com.     60      IN      SOA     ns-10.fortiadc-cloud.com. zhangwei.fortinet.com. 10004 3600 900 3600000
30

;; AUTHORITY SECTION:
fortiadc-cloud.com.     60      IN      NS      ns-10.fortiadc-cloud.com.

;; ADDITIONAL SECTION:
ns-10.fortiadc-cloud.com. 60    IN      A       52.32.144.112

;; Query time: 40 msec
;; SERVER: 52.32.144.112#53(52.32.144.112)
;; WHEN: Mon Jul 06 18:31:42 PDT 2020
;; MSG SIZE  rcvd: 137
```

4. If you enabled the DNSSEC for the domain, you can configure the DNSSEC by clicking **Manage Keys**. Select Key type and Algorithm, and paste the Public key without any spaces. Keys can be downloaded from the GSLB zone configuration page.



After you configure DNSSEC with your DNS service, add the applicable public key to the domain. Learn more

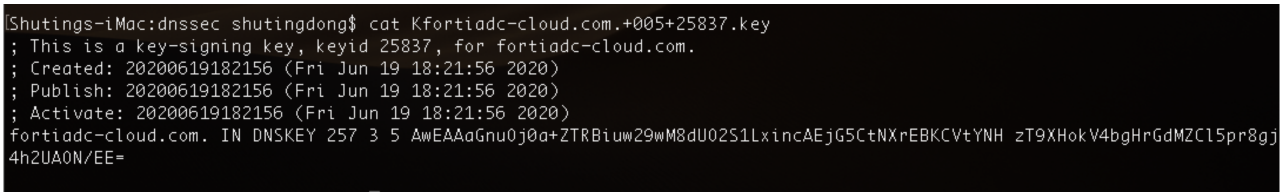
Your request for the creation of this DNSSEC entry was successfully submitted. It will be a few minutes before the listing is updated. You will receive an email when it is done, or if further action is necessary.

Key type: 257 - KSK

Algorithm: 5 - RSASHA1

Public key: AwEAAaGnu0j0a+ZTRBiuw29wM8dU02S1LxincAEjG5CtNXrEBKCVtYNHzT9XHokV4bg HrGdMZCl5pr8gj4h2UAON/EE=

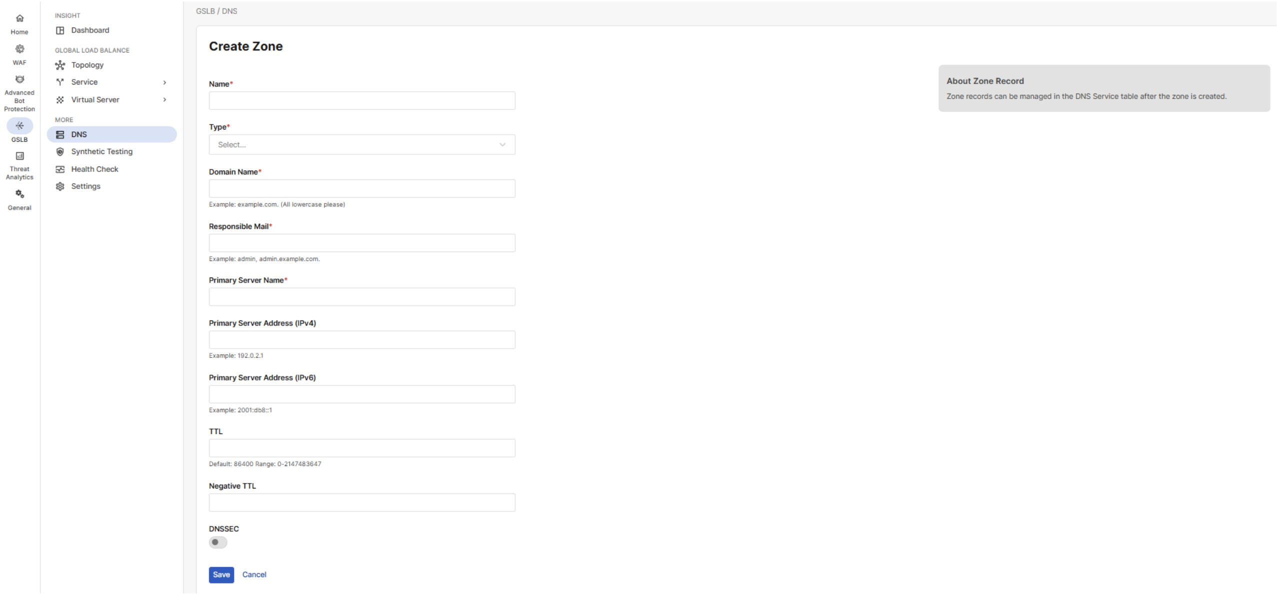
The following key file indicates that it is a key-signing key file and the algorithm is 5. Usually there will be two parts of the key, separated by a space. When you paste the key into Route 53 **Manage DNSSEC keys**, make sure to remove the space.



```
[Shutings-iMac:dnssec shutingdong$ cat Kfortiadc-cloud.com.+005+25837.key
; This is a key-signing key, keyid 25837, for fortiadc-cloud.com.
; Created: 20200619182156 (Fri Jun 19 18:21:56 2020)
; Publish: 20200619182156 (Fri Jun 19 18:21:56 2020)
; Activate: 20200619182156 (Fri Jun 19 18:21:56 2020)
fortiadc-cloud.com. IN DNSKEY 257 3 5 AwEAAaGnu0j0a+ZTRBiuw29wM8dU02S1LxincAEjG5CtNXrEBKCVtYNH zT9XHokV4bgHrGdMZCl5pr8gj
4h2UA0N/EE=
```

Configuring a New GSLB Application: Network Solutions Use Case Example

1. To begin, prepare the domain within GSLB. Navigate to **GSLB> DNS** and configure the Zone service settings. Ensure to take note of the **Domain Name**, **Primary Server Name**, and **Primary Server Address** fields. We recommend setting the **Primary Server Address** to match the assigned DNS Server IP.



Create Zone

Name*

Type*

Domain Name*

Example: example.com. (All lowercase please)

Responsible Mail*

Example: admin, admin.example.com.

Primary Server Name*

Primary Server Address (IPv4)

Example: 192.0.2.1

Primary Server Address (IPv6)

Example: 2001:db8::1

TTL

Default: 86400 Range: 0-2147483647

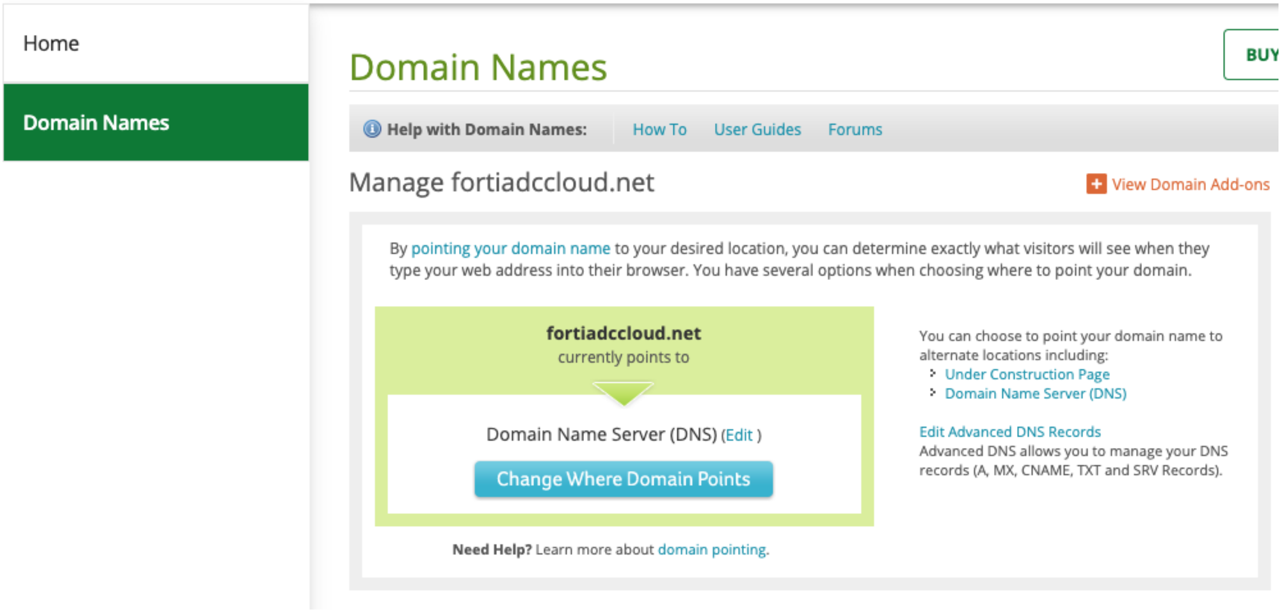
Negative TTL

DNSSEC

About Zone Record

Zone records can be managed in the DNS Service table after the zone is created.

2. Register a domain. Once completed, you should see a window like the one below.



Domain Names

Manage fortiadccloud.net

By pointing your domain name to your desired location, you can determine exactly what visitors will see when they type your web address into their browser. You have several options when choosing where to point your domain.

fortiadccloud.net
currently points to

Domain Name Server (DNS) (Edit)

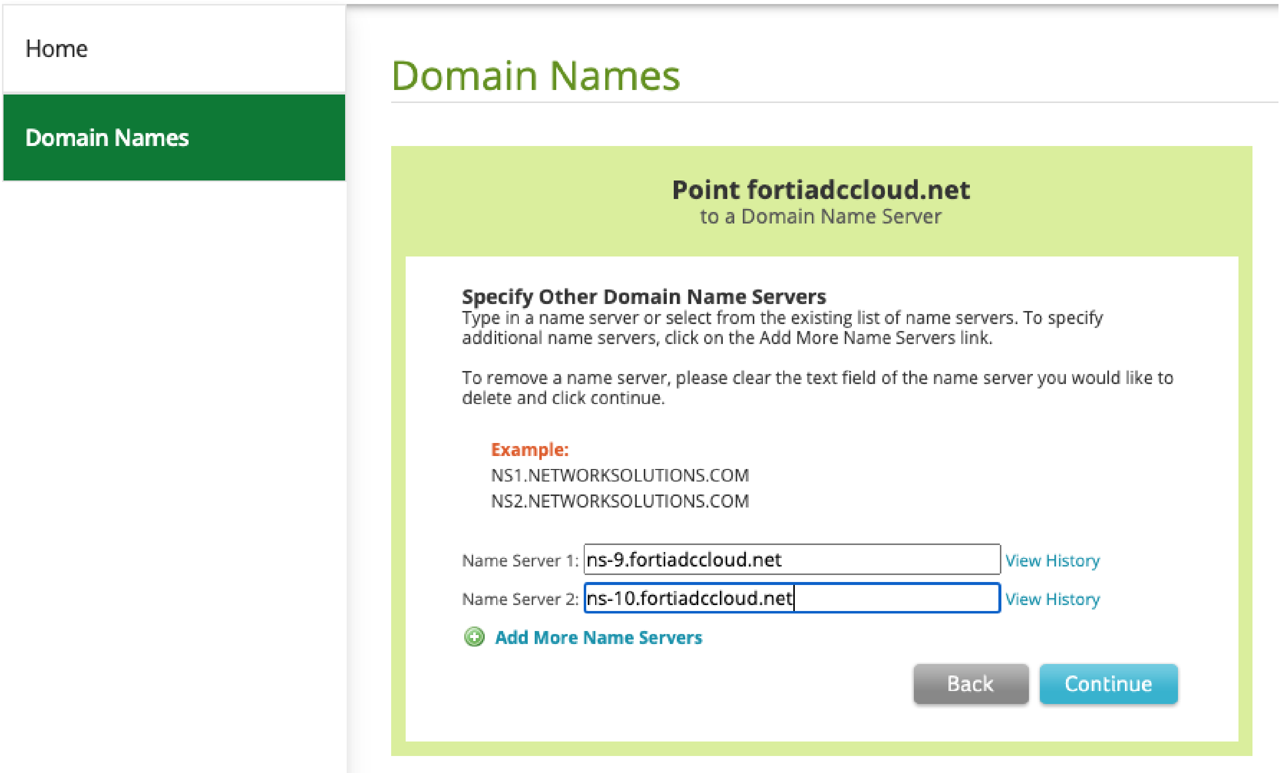
You can choose to point your domain name to alternate locations including:
- Under Construction Page
- Domain Name Server (DNS)

Edit Advanced DNS Records
Advanced DNS allows you to manage your DNS records (A, MX, CNAME, TXT and SRV Records).

Need Help? Learn more about domain pointing.

3. On your domain registrar, locate the page that allows you to change the destination of your domain.
   In the Network Solutions example case, click **Change Where Domain Points**. In the **Domain Name Pointing Options** window, select the **Domain Name Server (DNS)** option and click **Continue.**
4. When configuring with Network Solutions, you need at least two name servers. Designate Name Server 1 as the primary server and Name Server 2 as the secondary. In the **Specify Other Domain Name Servers** section, enter the NS server for Name Server 1, which corresponds to the Primary Server Name and Domain Name from the GSLB Zone page. If you have a backup server, input its NS info for Name Server 2. Otherwise, provide alternative

information and proceed.



Domain Names

Point fortiadccloud.net
to a Domain Name Server

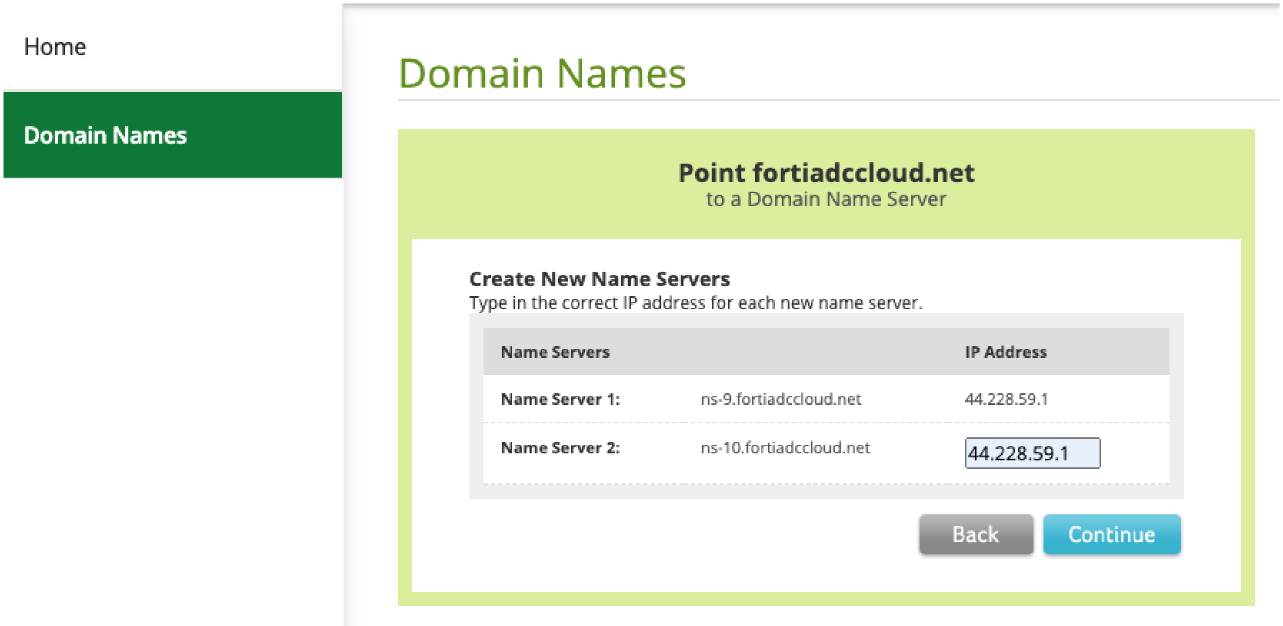
Specify Other Domain Name Servers
Type in a name server or select from the existing list of name servers. To specify additional name servers, click on the Add More Name Servers link.

To remove a name server, please clear the text field of the name server you would like to delete and click continue.

Example:
NS1.NETWORKSOLUTIONS.COM
NS2.NETWORKSOLUTIONS.COM

Name Server 1: ns-9.fortiadccloud.net View History
Name Server 2: ns-10.fortiadccloud.net View History

5. Under *Create New Name Servers*, input the IP address for Name Server 1 and input the backup server's IP address for Name Server 2. If you do not have a backup server, input the same IP as Name Server 1 and click **Continue**.



Domain Names

Point fortiadccloud.net
to a Domain Name Server

Create New Name Servers
Type in the correct IP address for each new name server.

Name Servers		IP Address
Name Server 1:	ns-9.fortiadccloud.net	44.228.59.1
Name Server 2:	ns-10.fortiadccloud.net	44.228.59.1

6. Double check the name server configuration and confirm the changes by clicking **Apply Changes**. It may take 24 - 48 hours for DNS changes take effect.
7. Click **Return to Domain Details**. After about 5 minutes, you will be able to `dig` the A record for this domain from the public DNS server.

Configuring GSLB Objects

Steps for configuration

Setting up an application for use with FortiAppSec Cloud involves two main steps:

1. Configure an FQDN for your application. This is done in *GSLB Services* > *Create FQDN*. See FQDN on page 270 for more information on configuration settings.

   Those using FortiADC, FortiGate, and FortiWeb can easily connect their services to GSLB with One-Click. One-Click enabled connectors automatically set up an FQDN. Therefore, if you choose to set up your application using the One-Click method, you don't need to perform this step manually.
2. Add your connector device to the FQDN created in the previous step. This is typically done in **Organization > Fabric Connectors**, but procedures vary for different kinds of connectors. Refer to Fabric connector on page 284 for detailed instructions on how to integrate your connector to GSLB.

Allow 1 to 2 minutes for GSLB to reload with the updated configurations.

Configuration example

The following is an example of how to set up GSLB with two devices: a Generic-Host connector and a FortiADC connector.

Scenario

The administrator manages the following devices:

- An HTTP service running on a FortiADC device in Oregon, USA
- An HTTP service running on a 3rd party device in Beijing, China

The administrator wants to achieve the following:

- The HTTP services should back up one another
  - DNS queries from China will be directed to the HTTP service IP address in Beijing, while queries from the United States will be directed to the HTTP service IP address in Oregon.
  - When the HTTP service in Oregon goes down, the HTTP service IP address in Beijing will respond.

    When the HTTP service in Beijing goes down, the HTTP service IP address in Oregon will respond.

    When both HTTP services go down, a default IP address will respond.

How to deploy this scenario

1. Enable One-Click on FortiADC, following the procedure for setting up FortiADC connectors.
2. Make sure the Connector FortiADC in Oregon is connected to GSLB.
   a. Go to *Fabric Connectors* > *Create Connector*
3. Make sure the FQDN is synced to GSLB.
   a. Navigate to *GSLB Services* and find the FQDN generated in step 2. Since this is a One-Click-enabled FQDN, its name typically follows the format OC_HostName_DomainName.

   b. Update Pool Select Method. See Virtual Server Pool on page 279 for more information on your configuration options.
      i. Click the pencil icon to edit the FQDN. The administrator's preferences outlined in the example scenario indicate that we should set the *Virtual Server Pool Selection Method* to *DNS-Query-Origin*.

   c. Update the location list for the existing pool created by One-Click.
      i. Scroll to the bottom of the *Edit FQDN* modal and locate the available member in the table. The name of this member should follow the format OCM_HostName.DomainName. Click the Edit icon.

      ii. Click *Create Location List* and add United States as a region. Click *Save* and go back to the member pool page.

      iii. Click *Save*. This brings you back to the *Edit FQDN* page. Save again to return to the FQDN service detail page.

4. Add the HTTP service in Beijing to FQDN.
   a. In the FQDN service detail page, click *Pool* and then click *Add pool*.
   b. Add a member pool for Beijing.

   c. Click *Create Location List* and add China as a region. Click *Save* and go back to the member pool page.
   d. Click *Create Virtual Server Pool* and create a pool for Beijing. Click *Save*.
   e. Click *Create Member* > *Create Virtual Server* > *Create Connector* and create a connector for Beijing.

   f. Click *Create Data Center* and create a China data center. Click *Save* and go back to the Create Connector page. Save the connector.
   g. Go to the *Create Virtual Server* page and create a virtual server. Click *Save*. This brings you back to the *Edit Member Virtual Server* page.

   h. Click *Save*. This brings you back to the *Create Pool* page.
   i. Click *Save*. This brings you back to the *Add Member Pool* page.
   j. Click *Save*. This brings you back to the *FQDN service detail* page.
   k. The *Virtual Servers* table now displays that the HTTP service in Beijing has been added to FQDN.

Troubleshooting

1. Click on the left-most icon in the top right corner to see your Assigned DNS server addresses.
   The Primary Anycast IP refers to the IP address returned for the One Click GSLB Server. However, in all other aspects, the Primary and Secondary IP addresses are equivalent and either one can be used for domain management tools that only require one address.

2. Use the DNS tool dig to query the service with one of your IP addresses.

Maintenance

To ensure the health and optimal performance of your GSLB service, we recommend staying up-to-date on the following:

- Migrate Legacy GSLB Organizations to FortiCloud Organizational Units (OU) on page 261

Anycast Migration for global DNS service

On September 8, 2023, the legacy FortiGSLB service transitioned to an Anycast DNS server to enable DNS service deployment across multiple regions. This Anycast DNS server remains in use in the updated FortiAppSec Cloud GSLB. If you have not yet updated your DNS server IP addresses, please add the current Anycast IP addresses promptly to ensure uninterrupted functionality.

Anycast is an IP network addressing method where requests from several physical destination servers can be combined under a single IP address. When a user makes a request, Anycast routers determine the optimal server in the network to handle the request based on factors like the user's location, the number of hops, shortest distance, lowest transit cost, and minimum latency. This optimization process prevents the need for the origin server to extend capacity and avoids service interruptions for clients seeking information from the origin server.

Once you set the Anycast IP address as the DNS server IP address, it automatically routes your DNS query results to the nearest FortiAppSec Cloud endpoint. This dynamic load-balancing reduces latency and improves response times for global queries.

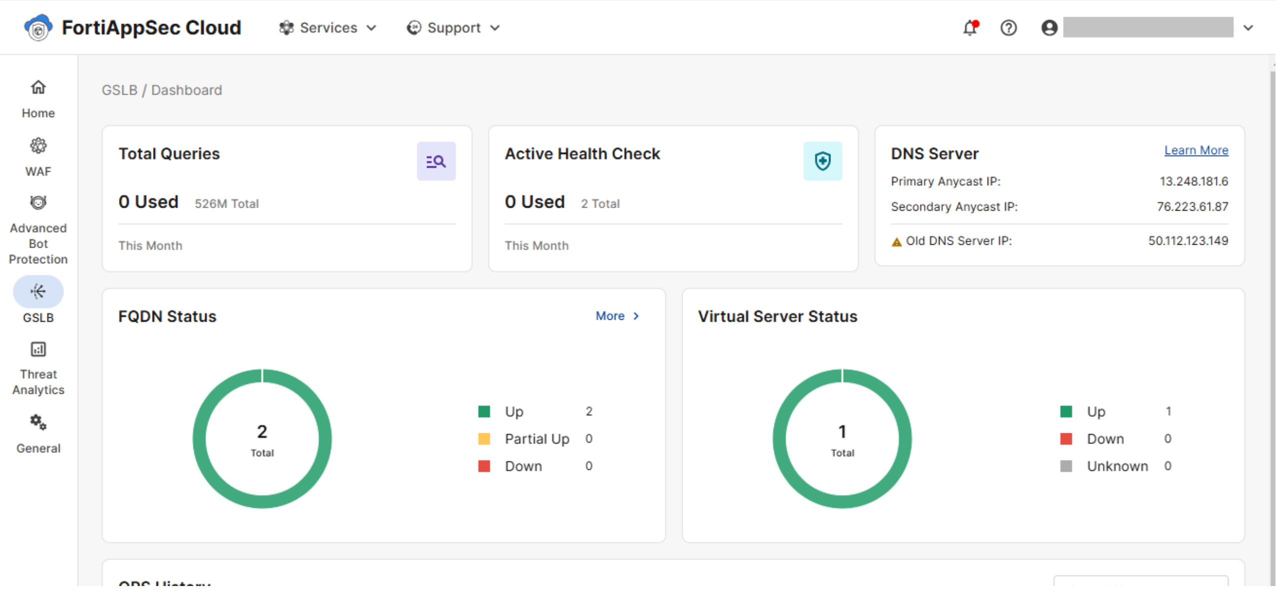
Changing the DNS IP (anycast) is not expected to cause service downtime. If you require any assistance, please see Contacting customer service.

How to migrate domains to Anycast

1. Log into the FortiAppSec Cloud portal.
2. Obtain the assigned Anycast IP address by navigating to GSLB > Dashboard. A yellow warning label will appear until you have successfully switched all of your domains to the new IP address(es).

   In the example below, the Anycast IP addresses are 13.248.181.6 and 76.223.61.87.

   Two Anycast IP addresses are provided as some domain management tools require each NS record to have two different IP addresses. The Primary Anycast IP refers to the IP address returned for the One Click GSLB Server. However, in all other aspects, the Primary and Secondary IP addresses are equivalent and either one can be used for domain management tools that only require one address.



FortiAppSec Cloud

GSLB / Dashboard

Total Queries

0 Used 526M Total

This Month

Active Health Check

0 Used 2 Total

This Month

DNS Server Learn More

Primary Anycast IP:	13.248.181.6
Secondary Anycast IP:	76.223.61.87
⚠ Old DNS Server IP:	50.112.123.149

FQDN Status More ›

2 Total

🟩 Up	2
🟨 Partial Up	0
🟥 Down	0

Virtual Server Status

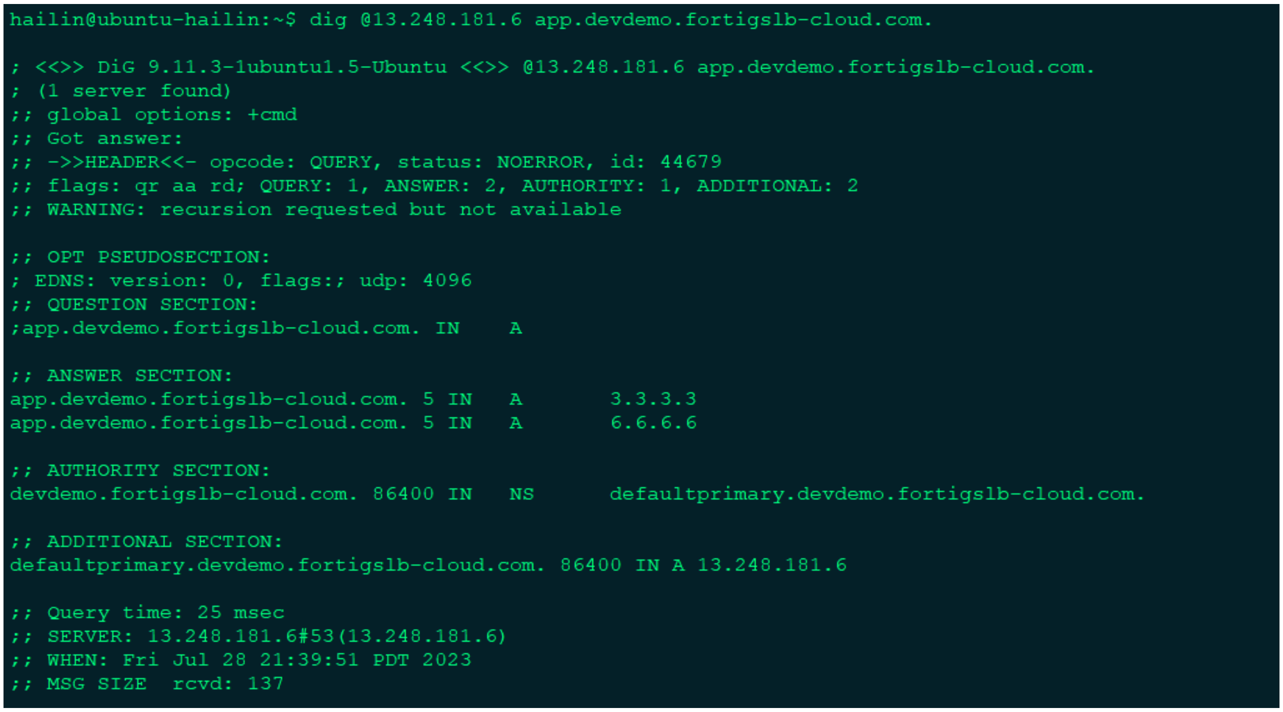
1 Total

🟩 Up	1
🟥 Down	0
⬜ Unknown	0

QPS History

3. Verify your domain works with the Anycast IP address by sending the DNS query traffic to Anycast DNS server directly. Here, your DNS query traffic still goes through the old DNS server.

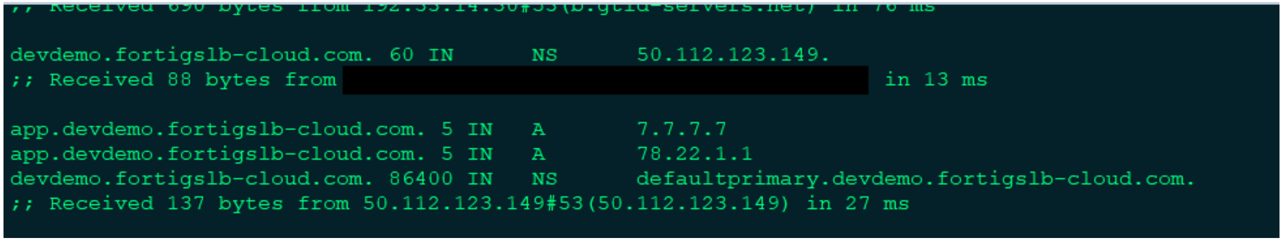
   In our example, the test domain is *app.devdemo.GSLB-cloud.com*. You could use `dig` or `nslookup` to verify it.



```
hailin@ubuntu-hailin:~$ dig @13.248.181.6 app.devdemo.fortigslb-cloud.com.

; <<>> DiG 9.11.3-1ubuntu1.5-Ubuntu <<>> @13.248.181.6 app.devdemo.fortigslb-cloud.com.
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 44679
;; flags: qr aa rd; QUERY: 1, ANSWER: 2, AUTHORITY: 1, ADDITIONAL: 2
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;app.devdemo.fortigslb-cloud.com. IN    A

;; ANSWER SECTION:
app.devdemo.fortigslb-cloud.com. 5 IN    A       3.3.3.3
app.devdemo.fortigslb-cloud.com. 5 IN    A       6.6.6.6

;; AUTHORITY SECTION:
devdemo.fortigslb-cloud.com. 86400 IN    NS      defaultprimary.devdemo.fortigslb-cloud.com.

;; ADDITIONAL SECTION:
defaultprimary.devdemo.fortigslb-cloud.com. 86400 IN A 13.248.181.6

;; Query time: 25 msec
;; SERVER: 13.248.181.6#53(13.248.181.6)
;; WHEN: Fri Jul 28 21:39:51 PDT 2023
;; MSG SIZE  rcvd: 137
```

4. Confirm your current configuration management tools are connected correctly. This is important as the Anycast DNS server will connect to your existing domain management tool.

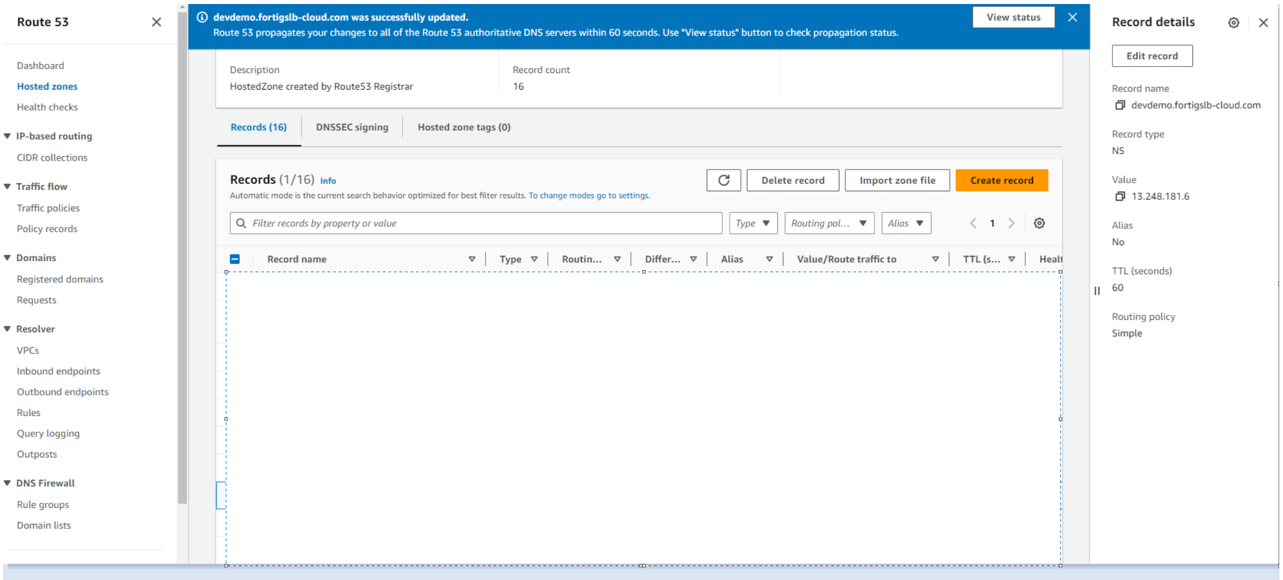
   In this example, we used `dig @8.8.8.8+trace` to verify the status.



```
;; Received 690 bytes from 192.55.14.30#53(b.gtld-servers.net) in 76 ms

devdemo.fortigslb-cloud.com. 60 IN      NS      50.112.123.149.
;; Received 88 bytes from [redacted] in 13 ms

app.devdemo.fortigslb-cloud.com. 5 IN   A       7.7.7.7
app.devdemo.fortigslb-cloud.com. 5 IN   A       78.22.1.1
devdemo.fortigslb-cloud.com. 86400 IN   NS      defaultprimary.devdemo.fortigslb-cloud.com.
;; Received 137 bytes from 50.112.123.149#53(50.112.123.149) in 27 ms
```

5. If you use a NS (Name Server) record to point your domain to GSLB, update the Anycast IP address to the NS record on your domain management tool.

   In this example, the NS record is configured on Route 53 and the NS record value is updated to “13.248.181.6”.



devdemo.fortigslb-cloud.com was successfully updated.
Route 53 propagates your changes to all of the Route 53 authoritative DNS servers within 60 seconds. Use "View status" button to check propagation status.

Description
HostedZone created by Route53 Registrar

Record count
16

Records (1/16)
Automatic mode is the current search behavior optimized for best filter results. To change modes go to settings.

Record details

Record name
devdemo.fortigslb-cloud.com

Record type
NS

Value
13.248.181.6

Alias
No

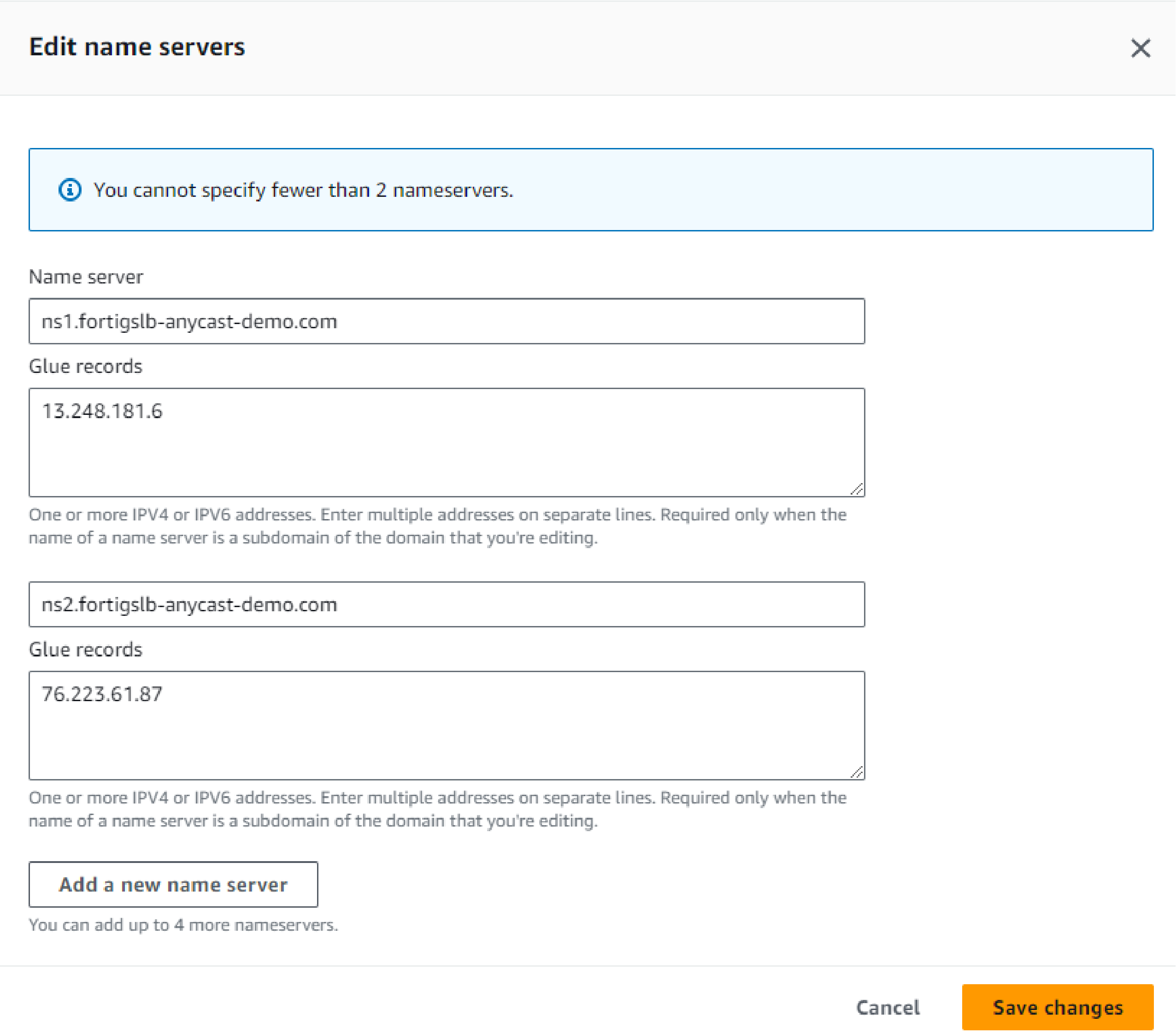
TTL (seconds)
60

Routing policy
Simple

If you use a glue record to point your domain to GSLB, update the Anycast IP address to the glue record on your domain management tool.

Pictured below is an example where the domain “GSLB-anycast-demo.com” is registered on AWS. Here, the domain will be configured under “Registered domains” in Route53 and the “Primary Anycast IP” and “Secondary Anycast IP” are updated to "Glue records".

In this case, the DNS request is delegated to GSLB.



Edit name servers ✕

ⓘ You cannot specify fewer than 2 nameservers.

Name server

ns1.fortigslb-anycast-demo.com

Glue records

13.248.181.6

One or more IPV4 or IPV6 addresses. Enter multiple addresses on separate lines. Required only when the name of a name server is a subdomain of the domain that you're editing.

ns2.fortigslb-anycast-demo.com

Glue records

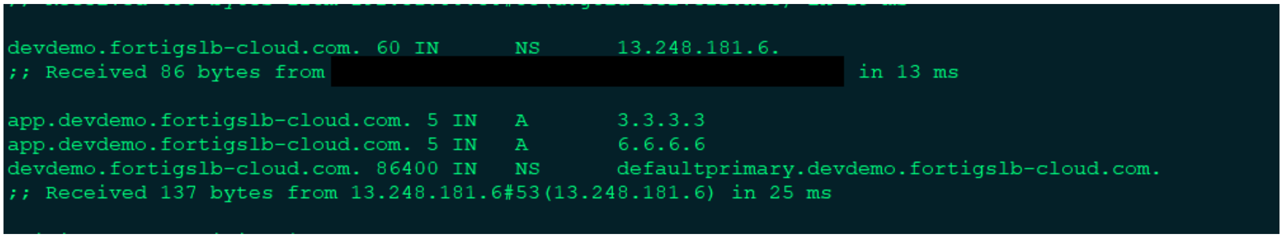
76.223.61.87

One or more IPV4 or IPV6 addresses. Enter multiple addresses on separate lines. Required only when the name of a name server is a subdomain of the domain that you're editing.

You can add up to 4 more nameservers.

Please note, DNS changes can take several minutes to 48 hours to fully propagate throughout the internet. Please consult your domain management tool for more information.

6. To confirm the change is in effect, use dig or nslookup to verify the status of the newly configured IP address.



```
devdemo.fortigslb-cloud.com. 60  IN      NS      13.248.181.6.
;; Received 86 bytes from [redacted] in 13 ms

app.devdemo.fortigslb-cloud.com. 5 IN   A       3.3.3.3
app.devdemo.fortigslb-cloud.com. 5 IN   A       6.6.6.6
devdemo.fortigslb-cloud.com. 86400 IN   NS      defaultprimary.devdemo.fortigslb-cloud.com.
;; Received 137 bytes from 13.248.181.6#53(13.248.181.6) in 25 ms
```

The GUI will also reflect that all domains have been successfully changed to the Anycast server.

Migrate Legacy GSLB Organizations to FortiCloud Organizational Units (OU)

This section addresses the use case for migrating legacy organization assets to FortiCloud. It applies specifically to former FortiGSLB users with multiple legacy organizations that have not yet migrated to FortiCloud.

Legacy FortiGSLB Organizations are no longer supported. Migrating to FortiCloud enables asset management, role- and resource-based access controls, and hierarchical structures for efficient provisioning and consistent security.

For information on how FortiCloud Organizational Units (OU) works, please refer to this document outlining its key concepts.

- Key features of migration on page 261
- Migration prerequisites on page 261
- Migration steps on page 262
- Manage users after migration on page 267

After the migration, please refer to FortiCloud Organizational Units on page 369 for additional information on how to use FortiCloud with FortiAppSec Cloud.

Key features of migration

Benefits of migrating to FortiCloud OU include:

- **Comprehensive asset management:** view, organize, and manage assets with search options in one place, and organize assets into multi-depth hierarchies.
- **Secure user management:** delegate role-based and resource-based access controls.
- **Multitenancy Management:** use hierarchical structures for flexible, efficient resource provisioning and consistent security management.

Please note that after migrating to FortiAppSec Cloud:

- You will no longer be able to choose FortiGSLB legacy organizations.
- You will only see the resources in OneClick type FortiGSLB legacy organization.

For further details on FortiCloud OU use cases and benefits, please refer to the FortiCloud Organization Portal Online Help.

Migration prerequisites

- FortiCloud account

If you plan to enable **Contract Sharing Mode**, please register your service license to the root account, as all member accounts under FortiCloud OUs share the root account's license for calculations. Licenses registered under non-root accounts within an organization will not count toward the service.

You can view your current license type in the FortiAppSec Cloud web portal under **General > Contracts**.

Migration steps

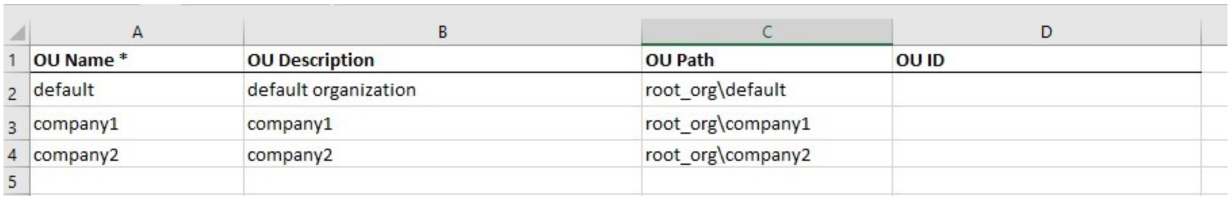
1. Log in to FortiCloud.
2. Turn on the Organization feature.
   a. Access the Organizational portal. Go to **My Account > My Account (IAM version) > Account Preferences** and click **Enable Organization Feature**.
   b. Go to https://support.fortinet.com/organizations.
   c. Click **Create Organization** and follow the prompts to create the Organization. For more details on the Organization creation screens, please see Creating an Organization.
3. Add Organization Structure. There are two ways to do this:
   - **Option 1:** Upload Organization Structure. Choose this option if you would like to import your legacy service organization structure to FortiAppSec Cloud.
   - **Option 2:**Option 2: Input Organization Info. Choose this option if you would like to customize your FortiCloud OU structure by manually inputting OUs and member accounts.

   Option 1: Upload Organization Structure

   a. Submit a ticket to request an **Organization Template** form with your legacy organization structure.
   b. Download the **Organization Template**.
   c. Edit the downloaded template, and update the values under **OU Path** to include the top-level organization's name, followed by a backslash.

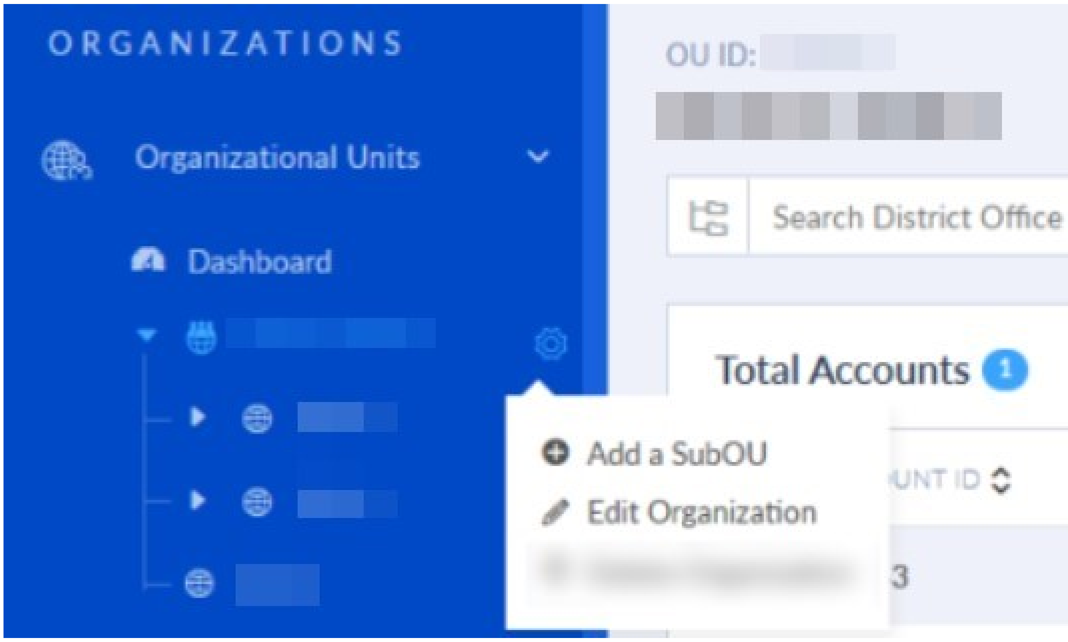
      For example, if the top-level organization's name is "root_org," change the OU Path value "company1" to "root_org\company1."

      Similarly, update OU Paths with multiple values, changing "example-company\subgroup1" to "root_org\example-company\subgroup1."



	A	B	C	D
1	**OU Name ***	**OU Description**	**OU Path**	**OU ID**
2	default	default organization	root_org\default	
3	company1	company1	root_org\company1	
4	company2	company2	root_org\company2	
5				

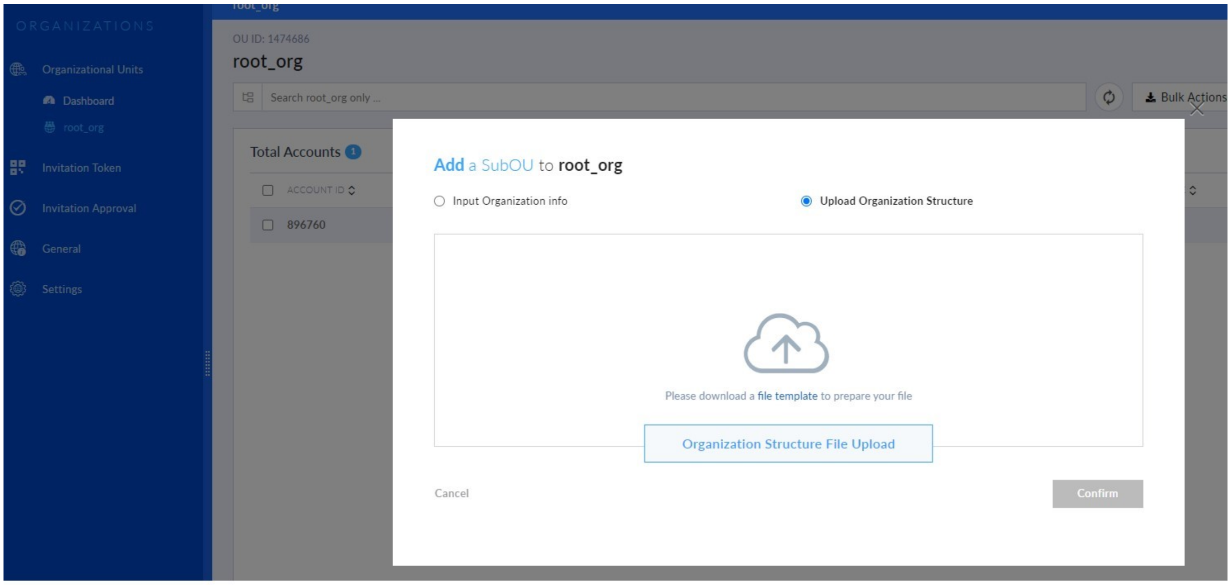
   d. Save the changes in your **Organization Template**.
   e. d. Return to FortiCloud. In the navigation menu, hover over your organization name and click the gear icon.



f. Click **Add a SubOU**. The **Add a SubOU to <org_name>** dialog opens.

g.

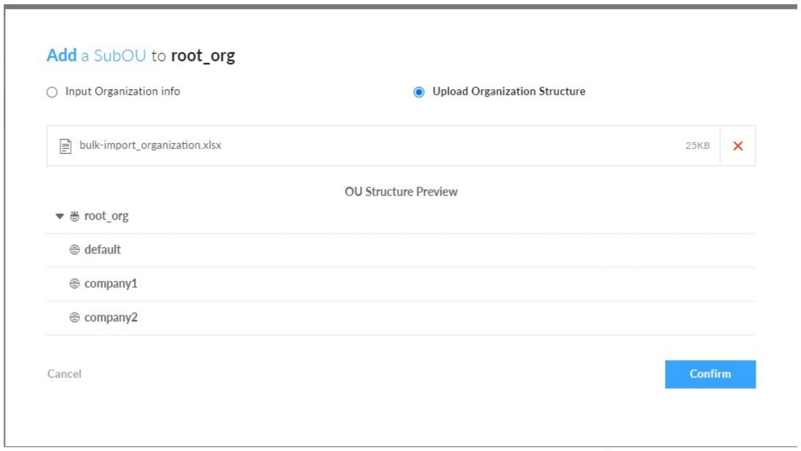
h. Select **Upload Organization Structure**, and upload the updated template from step **c.** This should auto-populate the **OU Structure Preview** window.



Add a SubOU to root_org

○ Input Organization info ● Upload Organization Structure

Please download a file template to prepare your file



Add a SubOU to root_org

○ Input Organization info ● Upload Organization Structure

bulk-import_organization.xlsx 25KB

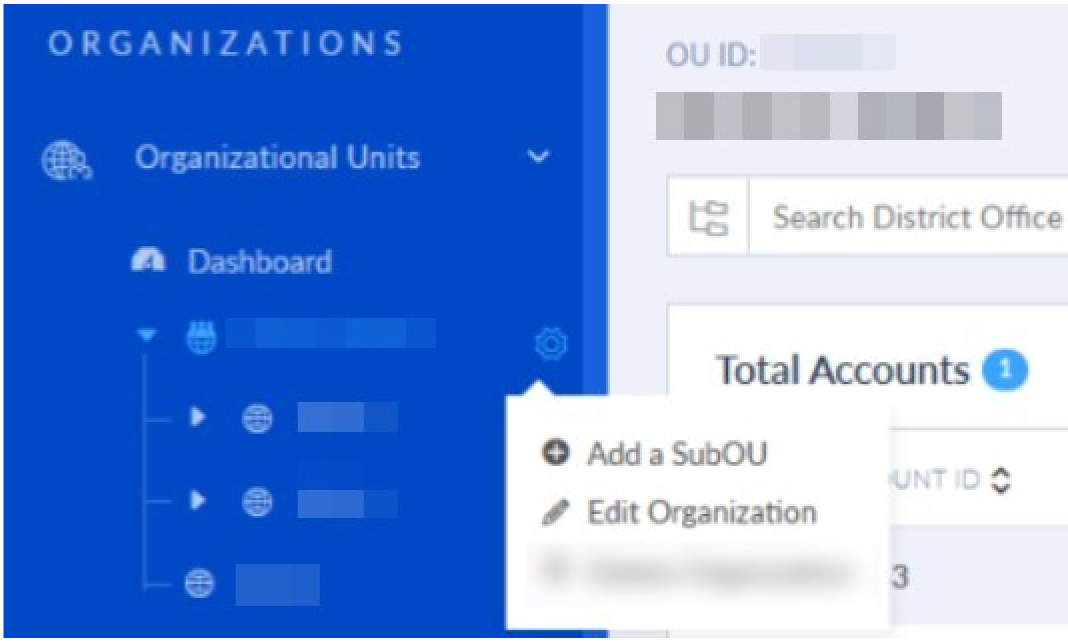
OU Structure Preview

- root_org
  - default
  - company1
  - company2

i. Click **Confirm**.

Option 2: Input Organization Info

a. In the **FortiCloud Organizations** navigation menu, hover over your organization name and click the gear icon.



b. Click **Add a SubOU**. The **Add a SubOU to <org_name>** dialog opens.

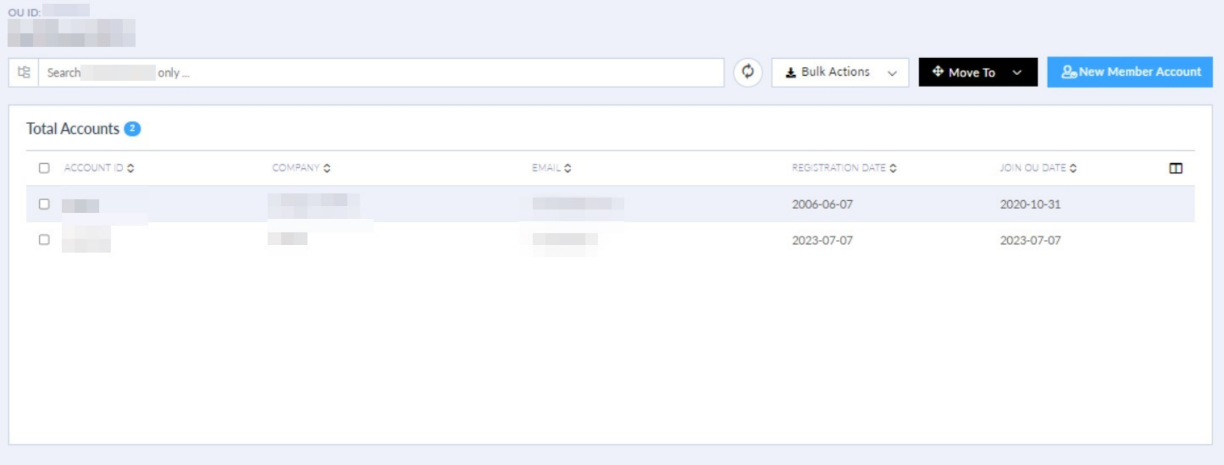
c. Enter the OU Name and OU Description, then click Confirm. The unit is added to the organization.

d. Repeat steps **a** and **b** until all organizations are added as desired.

4. Create member accounts for each desired OU. For more detailed information beyond the steps below, please refer to Creating new Member Accounts.

   Since FortiAppSec Cloud resources are tied to member accounts, it is mandatory to create a member account for each desired Organizational Unit (OU).

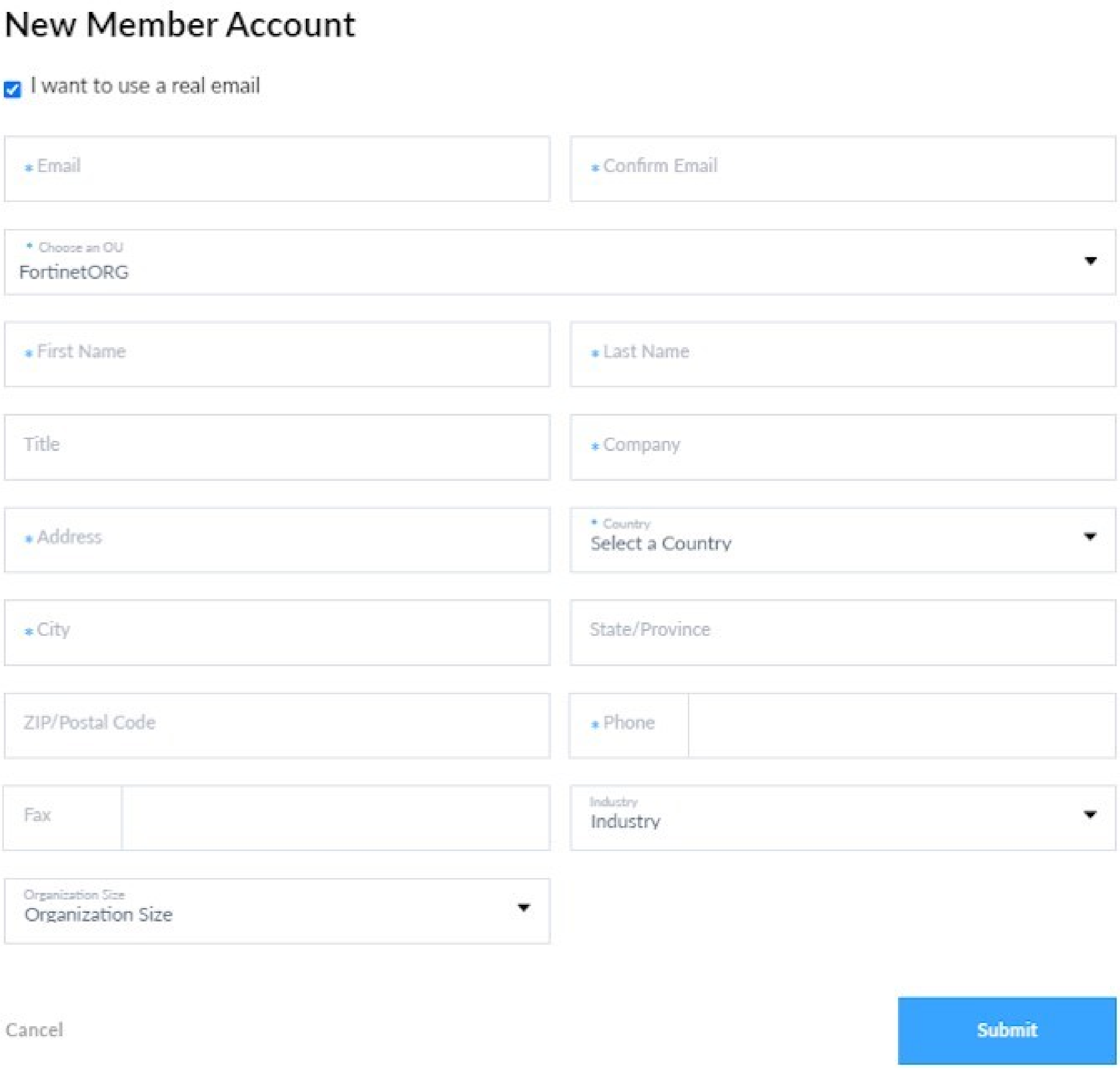
   a. In the left navigation bar, click on the desired OU under **Dashboard** to navigate to the page shown below.



Total Accounts 2

□	ACCOUNT ID	COMPANY	EMAIL	REGISTRATION DATE	JOIN OU DATE
□	[redacted]	[redacted]	[redacted]	2006-06-07	2020-10-31
□	[redacted]	[redacted]	[redacted]	2023-07-07	2023-07-07

   b. Click **New Member Account**, fill out the **New Member Account** fields as required, and click **Submit**.



New Member Account

☑ I want to use a real email

* Email | * Confirm Email

* Choose an OU: FortinetORG ▼

* First Name | * Last Name

Title | * Company

* Address | * Country: Select a Country ▼

* City | State/Province

ZIP/Postal Code | * Phone

Fax | Industry: Industry ▼

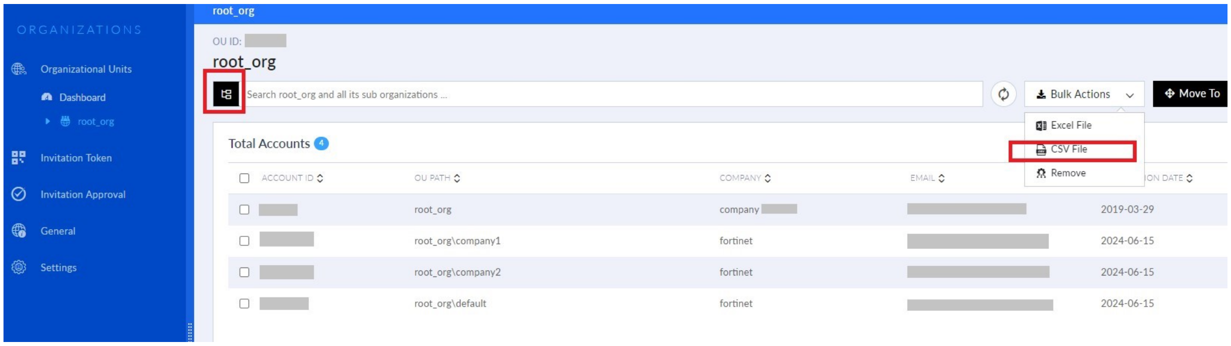
Organization Size: Organization Size ▼

c. Repeat previous steps **a** and **b** until all desired OUs have corresponding member accounts.

5. Export OU structure.

   a. In the left navigation bar, click on the top-level organization.

   b. Click the hierarchy icon to ensure sub-organization units are selected. Then, from the Bulk Actions dropdown list, select **CSV File**.



OU ID: [redacted]

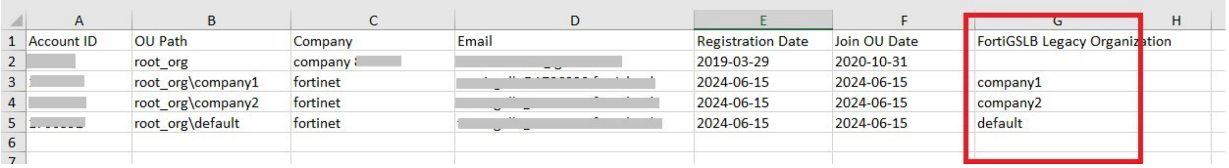
root_org

Search root_org and all its sub organizations ...

Total Accounts 4

	ACCOUNT ID	OU PATH	COMPANY	EMAIL	ON DATE
□	[redacted]	root_org	company [redacted]	[redacted]	2019-03-29
□	[redacted]	root_org\company1	fortinet	[redacted]	2024-06-15
□	[redacted]	root_org\company2	fortinet	[redacted]	2024-06-15
□	[redacted]	root_org\default	fortinet	[redacted]	2024-06-15

c. Download the organization file and edit it to include a column specifying the legacy FortiGSLB organization associated with each member account. This ensures we can identify which assets to migrate to the corresponding new member accounts.



	A	B	C	D	E	F	G	H
1	Account ID	OU Path	Company	Email	Registration Date	Join OU Date	FortiGSLB Legacy Organization	
2	[redacted]	root_org	company [redacted]	[redacted]	2019-03-29	2020-10-31		
3	[redacted]	root_org\company1	fortinet	[redacted]	2024-06-15	2024-06-15	company1	
4	[redacted]	root_org\company2	fortinet	[redacted]	2024-06-15	2024-06-15	company2	
5	[redacted]	root_org\default	fortinet	[redacted]	2024-06-15	2024-06-15	default	
6								
7								

6. If you would like to enable **Contract Sharing Mode**, go to **General > Settings** and enable **Contract Sharing Mode**.
7. Ensure all member accounts log in to the FortiAppSec Cloud portal. This step saves the account information needed for the next phase.
8. Submit a ticket requesting the FortiAppSec GSLB team to complete your migration to FortiCloud OU. Be sure to attach the OU Structure file downloaded and modified in Step 5.

   For guidance on submitting support tickets, please refer to Submitting support tickets on page 373

   Once the ticket is received, the GSLB team will synchronize the new member accounts and root account, binding the legacy FortiGSLB organizations to the corresponding new accounts as specified in the OU structure file.

⚠ If you would like to transfer your One-Click device to your new membership account, please wait to do so until the migration is complete.

You can check the status of the migration in the **Ticket Conversation** on FortiCare.

For more information on FortiCare tickets, see Ticket details.

Manage users after migration

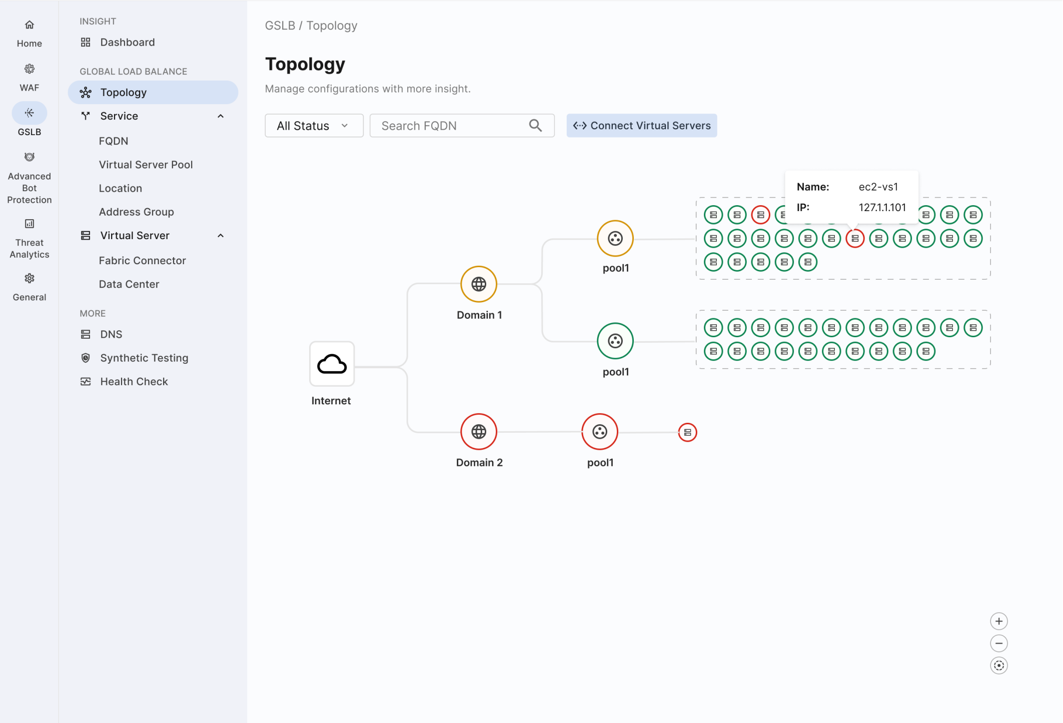
To manage IAM users' access to FortiAppSec Cloud GSLB resources under different member accounts, you can either edit an existing IAM user and set their Type to Organization, or create a new Organization type IAM user.

For details on advanced user management, please refer to Organization User Management.

For instructions on creating a new IAM user, please refer to FortiCloud IAM Users on page 364

Topology

The **Topology** page provides a clear view of your configuration flow by displaying the relationships between your GSLB objects, helping you gain a deeper understanding of their connections. You can either create objects and their relationships on this page, or individually create each component by following the instructions on Onboarding GSLB Applications on page 248.



Topology

Manage configurations with more insight.

Name: ec2-vs1

IP: 127.1.1.101

Configure Topology

1. **Add Fabric connectors and Virtual Servers**

   If you have a physical Fortinet device (e.g., FortiGate) and want to start with server management, begin with this step. If you prefer to focus on network identity and are familiar with DNS, proceed to the next step to set up your FQDN.

   a. Click **Connect Virtual Servers** to configure fabric connectors and virtual servers.

      Connectors in GSLB are linked to a physical device at the data center which houses virtual servers, from which the cloud can fetch all the virtual servers running information.

      For more information on the configuration options on this page, please refer to Fabric connector on page 284.

2. **Add FQDN**

   An FQDN object maps a fully qualified domain name (FQDN) to a set of virtual servers (pool). For additional details on FQDNs, please refer to FQDN on page 270.

   a. Return to the **Topology** page, and right-click **Assigned DNS Server**.

   b. Click **Add FQDN**.

      For more information on the configuration options for this object, please refer to FQDN on page 270.

   c. Click **Save** to return to the **Topology** page.

3. **Add Virtual Server Pool**

   a. On the **Topology** page, right-click the FQDN you added in the previous step.

   b. Click **New Virtual Server Pool**.

      For more information on the configuration options for this object, please refer to Virtual Server Pool on page 279.

      Click **Save** to return to the **Topology** page.

4. **Add Virtual Server to Virtual Server Pool**

a. On the **Topology** page, click **Connect Virtual Servers**.

b. Add the desired Virtual Servers you configured in step 1 to the Virtual Server Pool(s) you created in step 3.

   We recommend placing virtual servers with similar functions or locations into the same pool.

Edit Topology

To edit the relationship between objects in your Topology, click and drag an object to move it to a different parent object in the Topology tree.

To edit settings on individual objects:

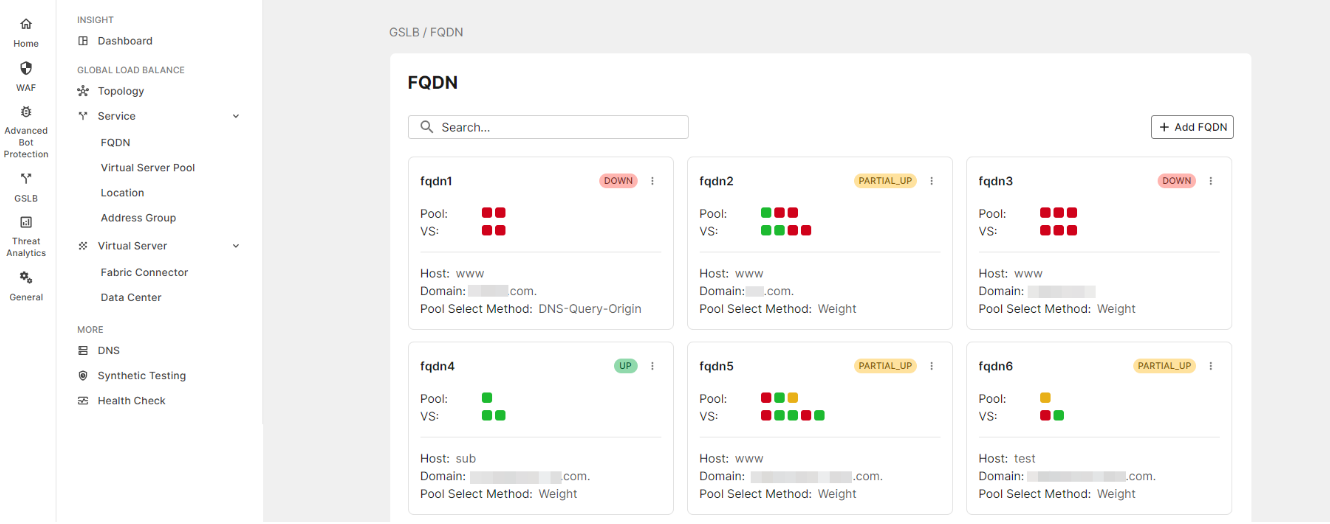
1. Right-click the object you would like to edit.
2. Click **Edit** to open a modal window with configuration options for the selected object.
3. Make the desired changes.
4. Click **Save**.

Service

- FQDN
- Virtual Server Pool on page 279
- Synthetic testing on page 299
- Location on page 281
- Address group on page 283

FQDN

The FQDN object is a GSLB Service. An FQDN object will map a fully-qualified domain name (FQDN) to a set of virtual servers (pool). Administrators can set a global geographic policy in this object. After the administrator has defined the pool objects and the location objects, a pool object can bind a location object as a member for the FQDN object, and the FQDN object can define multiple members. When the DNS queries are trying to reach the GSLB, it will do the first level load balance according the virtual server pool selection method. Then, the DNS queries will be forwarded to a pool and the virtual servers will respond according to the pool's preferred schedule methods for the queries.



fqdn1 DOWN
Pool: 🟥🟥
VS: 🟥🟥
Host: www
Domain: [redacted].com.
Pool Select Method: DNS-Query-Origin

fqdn2 PARTIAL_UP
Pool: 🟩🟥🟥
VS: 🟩🟩🟥🟥
Host: www
Domain: [redacted].com.
Pool Select Method: Weight

fqdn3 DOWN
Pool: 🟥🟥🟥
VS: 🟥🟥🟥
Host: www
Domain: [redacted]
Pool Select Method: Weight

fqdn4 UP
Pool: 🟩
VS: 🟩🟩
Host: sub
Domain: [redacted].com.
Pool Select Method: Weight

fqdn5 PARTIAL_UP
Pool: 🟥🟩🟨
VS: 🟥🟩🟩🟥🟩
Host: www
Domain: [redacted].com.
Pool Select Method: Weight

fqdn6 PARTIAL_UP
Pool: 🟨
VS: 🟥🟩
Host: test
Domain: [redacted].com.
Pool Select Method: Weight

Creating an FQDN

1. Click **Add FQDN**.
2. Enter the following:
3.

Settings	Guidelines
Name	The name of the FQDN. This cannot be modified after the FQDN is created.
Host Name	The hostname part of the FQDN, such as www. Note: You can specify the @ symbol to denote the zone root. The value substituted for @ is the preceding $ORIGIN directive.
Domain Name	The domain name must end with a period. For example: example.com. This cannot be modified after FQDN is created.
Respond Single Record	Enable/disable an option to send only the top record in response to a query. Disabled by default. By default, the response is an ordered list of records.
Virtual Server Pool Selection Method	Virtual Server Pool Selection Method: Weight: DNS queries will be load balanced to pool by weight, and the virtual server will respond according to the pool's preferred schedule methods. DNS-Query-Origin:

Settings	Guidelines
	DNS queries will be load balanced to the pool with the same geographic information as the local DNS address, and the virtual server will respond according to the pool's preferred schedule methods. Global-Availability: DNS queries will be load balanced to the first available pool in the FQDN pool member list, and the virtual server will respond according to the pool's preferred schedule methods.
Default Feedback IPv4	Specify an IP address to return in the DNS answer if no virtual servers are available.
Default Feedback IPv6	Specify an IPv6 address to return in the DNS answer if no virtual servers are available.

Configuring FQDN members text field

Settings	Guidelines
Name	The name of the member
Virtual server pool	Specify a pool for this FQDN.
Weight	Assign a weight. Valid values range from 1 to 255.
Location List	Bind a location for the pool. A location list configuration consists of a list of locations you select. **Note**: The **any** location object is a default configuration that includes all regions in the database. When the **any** location list is applied, all traffic that do not match the other locations will then match to any other region that has not been specified.
Address Group	Bind an address group for the pool. An address group configuration consists of a list of IP/Netmasks or IP ranges. **Note**: IP/Netmasks: 0.0.0.0/0 indicates all IPv4 IP addresses.

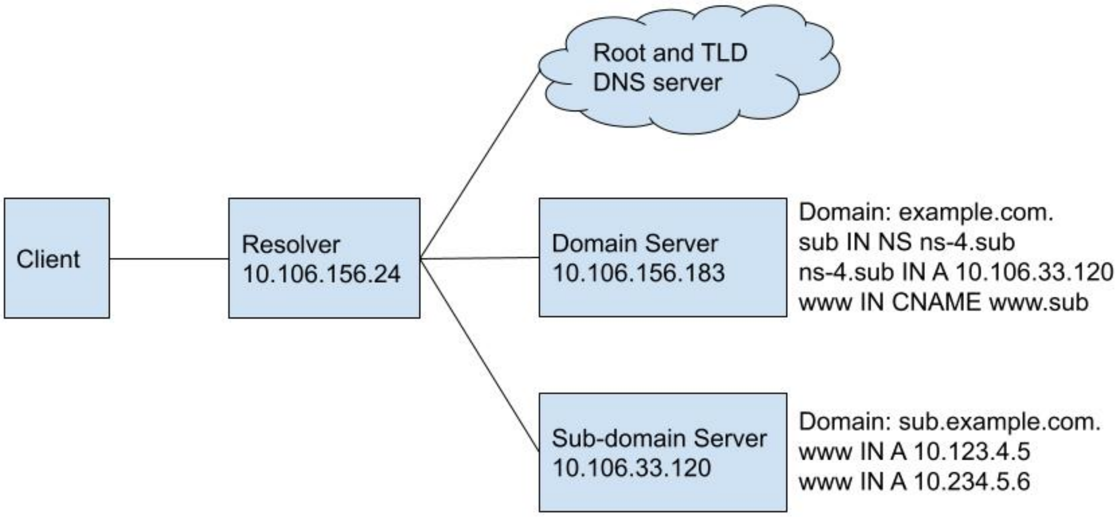
FQDN service logs

Refer to FQDN Logs for more information.

How to make an existing FQDN work with GSLB

Example: You have an existing domain ‘example.com’ running on a DNS server that does not support global app load balance. Your FQDN ‘www.example.com' pointed to a single host 10.123.4.5. When business grew, you brought in another server 10.234.5.6 also have this service.

Now you would like to have global app load balancing for the FQDN. However, you still want your other FQDNs running on your existing DNS server. To do this, change the A record for ‘www.example.com’ to a CNAME record, and point it to ‘www.sub.example.com’. Add ‘sub.example.com’ as a sub-domain. Then configure ‘www.sub.example.com’ global app load balance service on GSLB.



Steps

1. Configure the GSLB for sub-domain 'sub.example.com'.
   a. Go to *DNS Services* and click *Create DNS Services* or *Create New*. Add a DNS service for the sub-domain and name the Primary Server Name as ns-4. The DNS server address in this example is 10.106.33.120.
   b. Add a FQDN service for 'www.sub.example.com'. For detailed instructions, see Setting up an FQDN with Generic-Host connector on page 304.
2. Configure the ‘sub.example.com’ as a sub-domain of ‘example.com’ by adding a NS record in the domain configuration. You may need a NS record that points ‘sub.example.com’ to ‘ns-4.sub.example.com’, and another A record that points ‘ns-4.sub.example.com’ to 10.106.33.120.
   The following is an example from FortiADC. The FortiADC will automatically create these two records according to the configuration settings.
3. Remove the old A record for 'www.example.com' and replace it with a CNAME record. Alias 'www.example.com.' to the Target Name 'www.sub.example.com.'.

   CNAME Record example from FortiADC
4. Verify the configuration by querying the resolver 10.106.156.24 using any of the following methods. We recommend using `dig` for Linux, and `nslookup` or `Resolve-DnsName` for Windows.
   The expected query output is as follows:

   Linux - `dig`

   Windows - `nslookup`

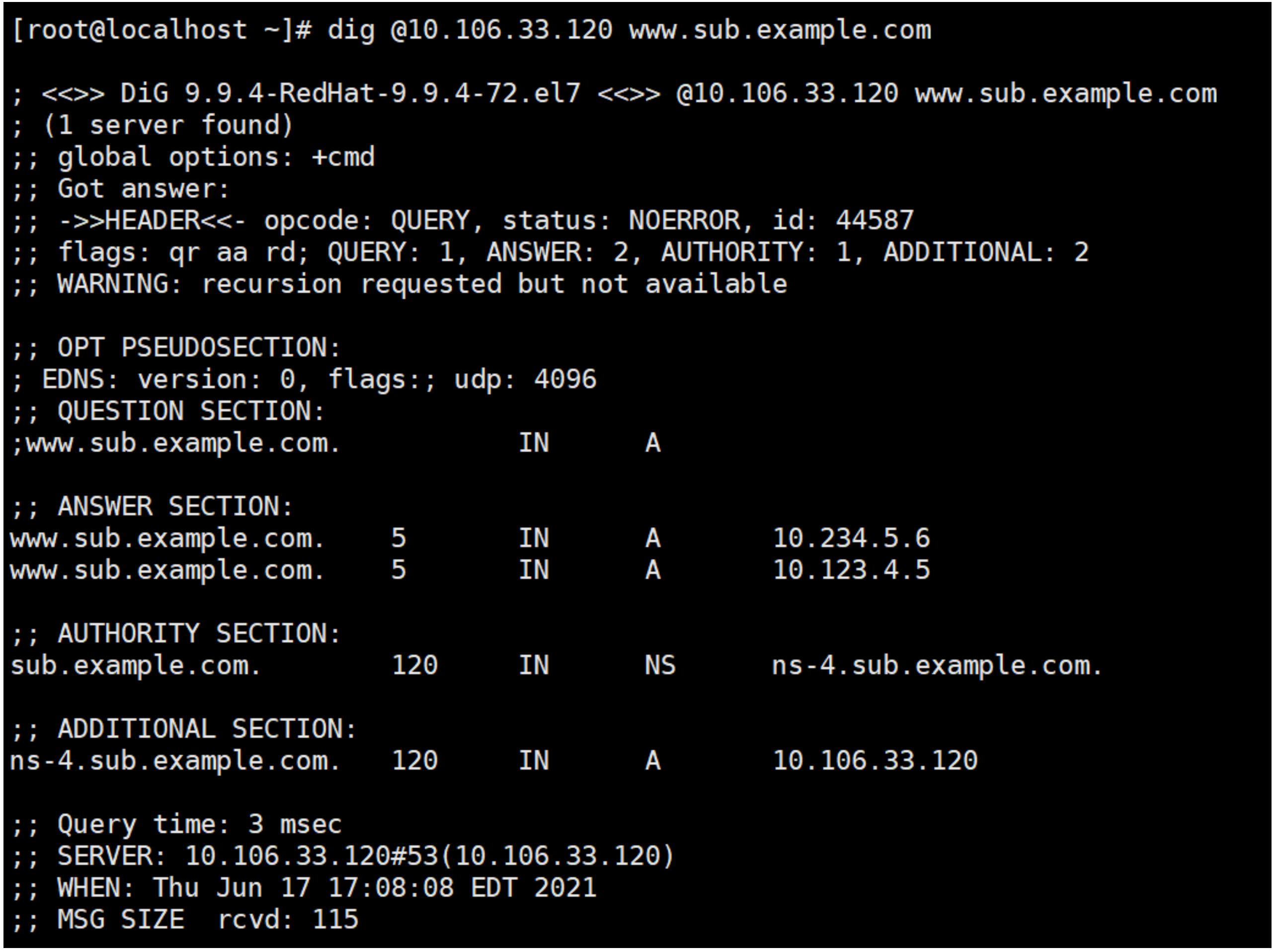
   Windows - `Resolve-DnsName`

If you configure steps 1 – 3 correctly, your host should now be able to load balance between two data centers. You can test this by querying the pubic DNS resolver 8.8.8.8 multiple times and seeing the order of the two IP address change when the TTL counts down.

Debugging

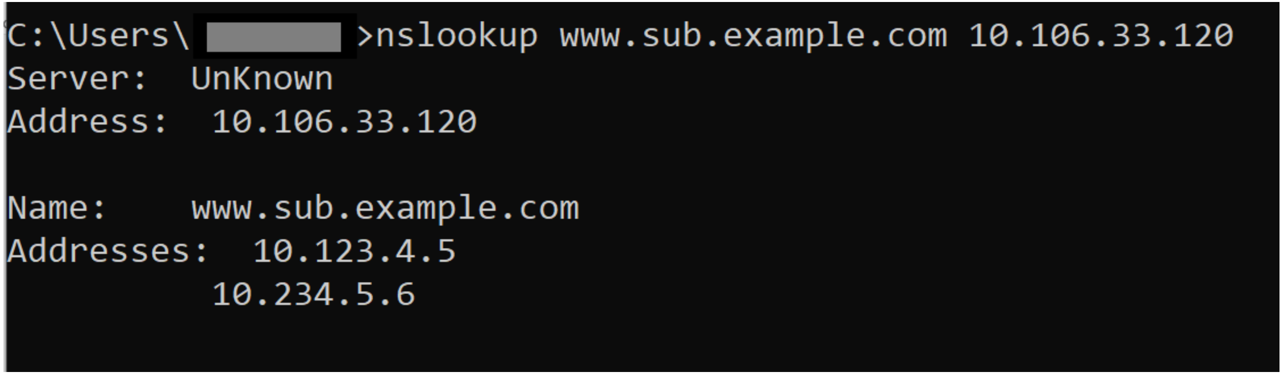
If verification fails, the user will need to debug according to the steps below:

1. Test the sub-domain A record by querying the sub-domain DNS server 10.106.33.120 directly.
   Linux - `dig`



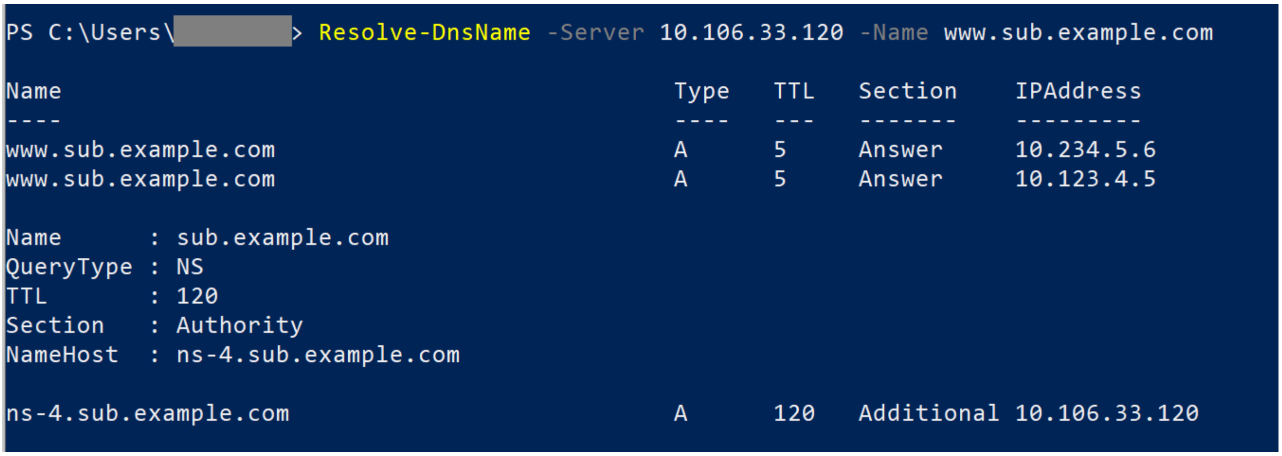
```
[root@localhost ~]# dig @10.106.33.120 www.sub.example.com

; <<>> DiG 9.9.4-RedHat-9.9.4-72.el7 <<>> @10.106.33.120 www.sub.example.com
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 44587
;; flags: qr aa rd; QUERY: 1, ANSWER: 2, AUTHORITY: 1, ADDITIONAL: 2
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.sub.example.com.           IN      A

;; ANSWER SECTION:
www.sub.example.com.    5       IN      A       10.234.5.6
www.sub.example.com.    5       IN      A       10.123.4.5

;; AUTHORITY SECTION:
sub.example.com.        120     IN      NS      ns-4.sub.example.com.

;; ADDITIONAL SECTION:
ns-4.sub.example.com.   120     IN      A       10.106.33.120

;; Query time: 3 msec
;; SERVER: 10.106.33.120#53(10.106.33.120)
;; WHEN: Thu Jun 17 17:08:08 EDT 2021
;; MSG SIZE  rcvd: 115
```

   Windows - `nslookup`



```
C:\Users\[redacted]>nslookup www.sub.example.com 10.106.33.120
Server:  UnKnown
Address:  10.106.33.120

Name:    www.sub.example.com
Addresses:  10.123.4.5
          10.234.5.6
```

   Windows - `Resolve-DnsName`

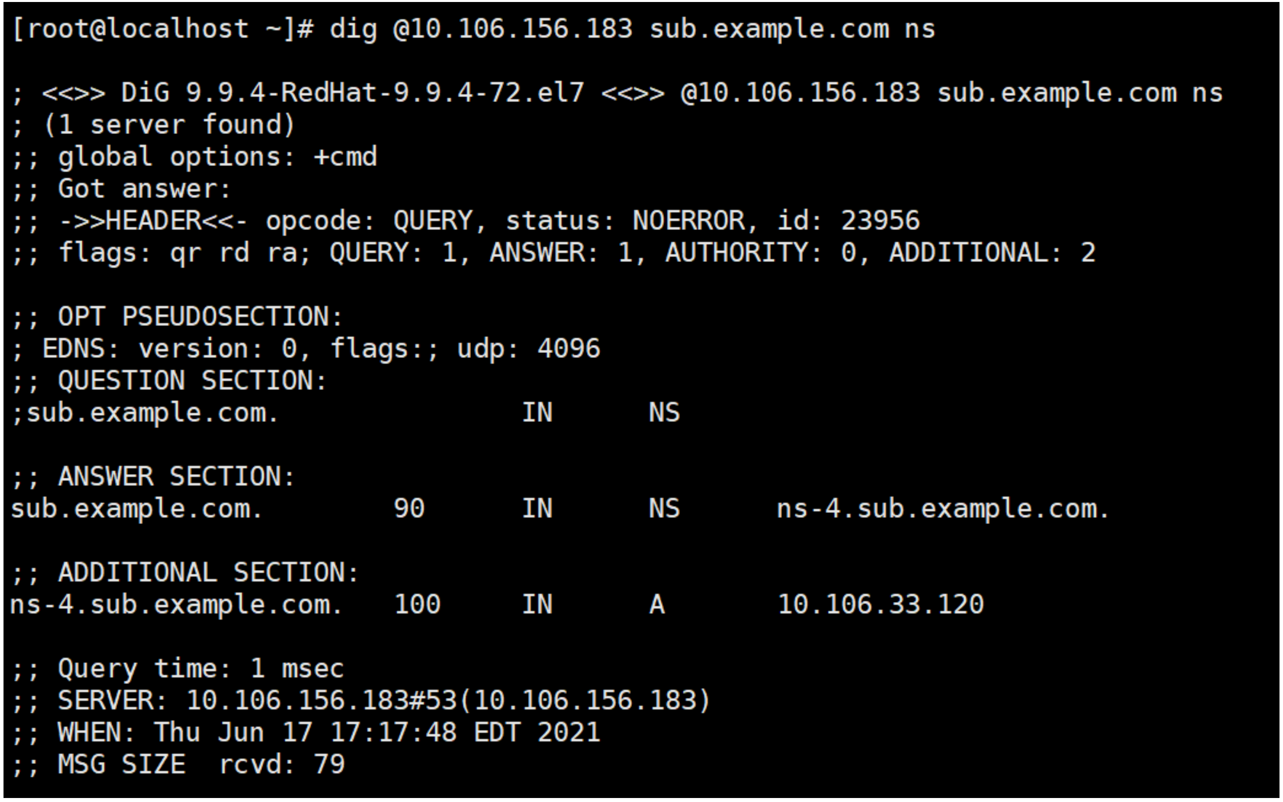


```
PS C:\Users\[redacted]> Resolve-DnsName -Server 10.106.33.120 -Name www.sub.example.com

Name                                           Type   TTL   Section    IPAddress
----                                           ----   ---   -------    ---------
www.sub.example.com                            A      5     Answer     10.234.5.6
www.sub.example.com                            A      5     Answer     10.123.4.5

Name       : sub.example.com
QueryType  : NS
TTL        : 120
Section    : Authority
NameHost   : ns-4.sub.example.com

ns-4.sub.example.com                           A      120   Additional 10.106.33.120
```

a. If the test fails, remove all other records from Zone service and try again. The Zone service may take a minute to reload after the configuration changes.

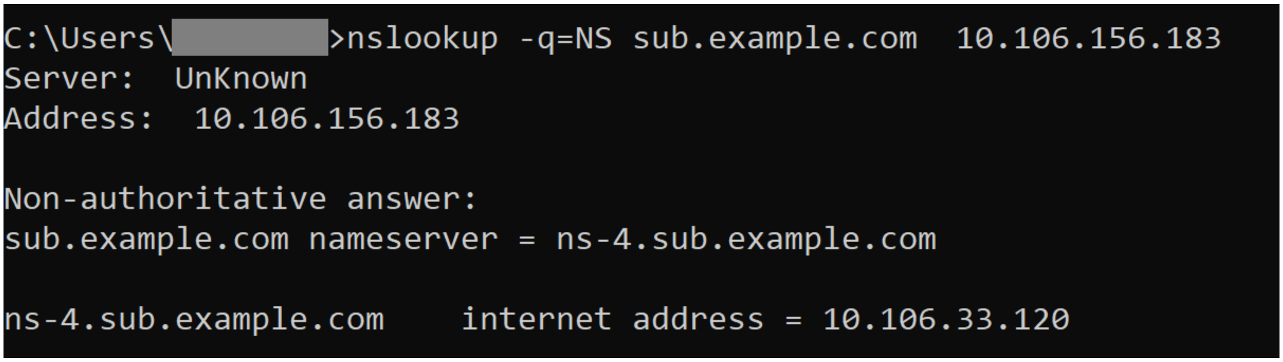
2. Test the NS record by querying the domain server 10.106.156.183.

Linux - `dig`



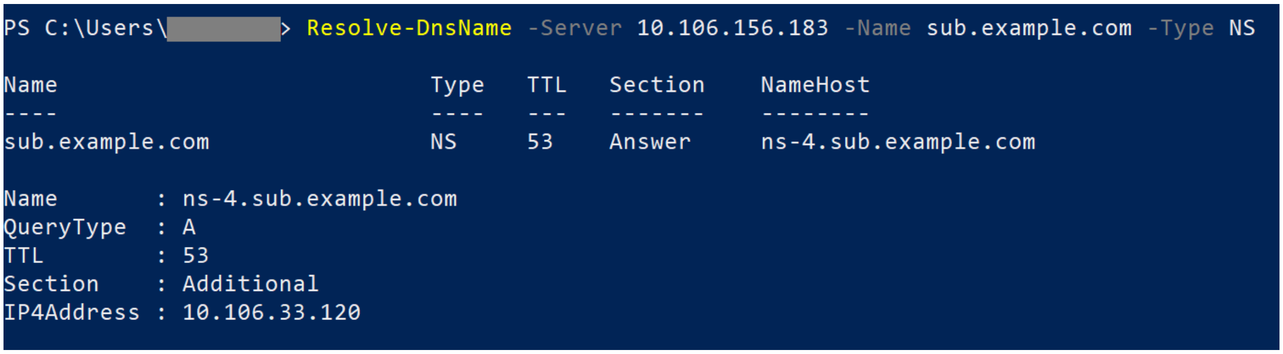
```
[root@localhost ~]# dig @10.106.156.183 sub.example.com ns

; <<>> DiG 9.9.4-RedHat-9.9.4-72.el7 <<>> @10.106.156.183 sub.example.com ns
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 23956
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 2

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;sub.example.com.               IN      NS

;; ANSWER SECTION:
sub.example.com.        90      IN      NS      ns-4.sub.example.com.

;; ADDITIONAL SECTION:
ns-4.sub.example.com.   100     IN      A       10.106.33.120

;; Query time: 1 msec
;; SERVER: 10.106.156.183#53(10.106.156.183)
;; WHEN: Thu Jun 17 17:17:48 EDT 2021
;; MSG SIZE  rcvd: 79
```

Windows - `nslookup`



```
C:\Users\[redacted]>nslookup -q=NS sub.example.com  10.106.156.183
Server:  UnKnown
Address:  10.106.156.183

Non-authoritative answer:
sub.example.com nameserver = ns-4.sub.example.com

ns-4.sub.example.com    internet address = 10.106.33.120
```

Windows - `Resolve-DnsName`

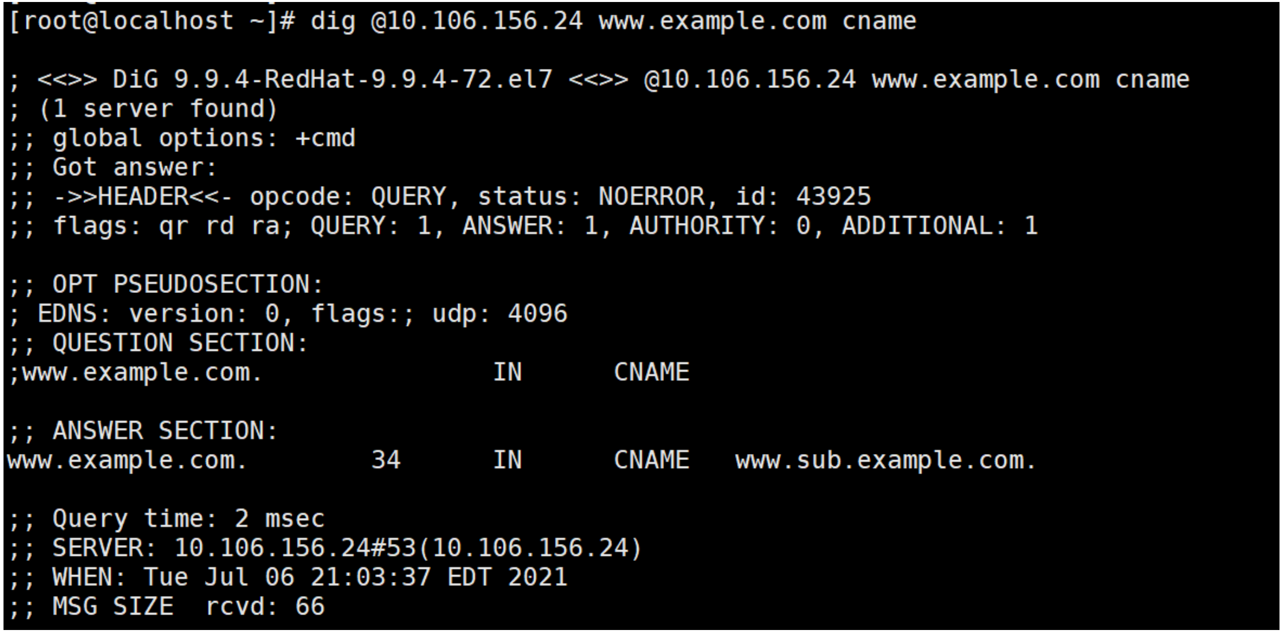


```
PS C:\Users\[redacted]> Resolve-DnsName -Server 10.106.156.183 -Name sub.example.com -Type NS

Name                           Type   TTL   Section    NameHost
----                           ----   ---   -------    --------
sub.example.com                NS     53    Answer     ns-4.sub.example.com

Name       : ns-4.sub.example.com
QueryType  : A
TTL        : 53
Section    : Additional
IP4Address : 10.106.33.120
```

a. If the test fails, check to see if the NS record conflicts with any other records in the Zone configuration.

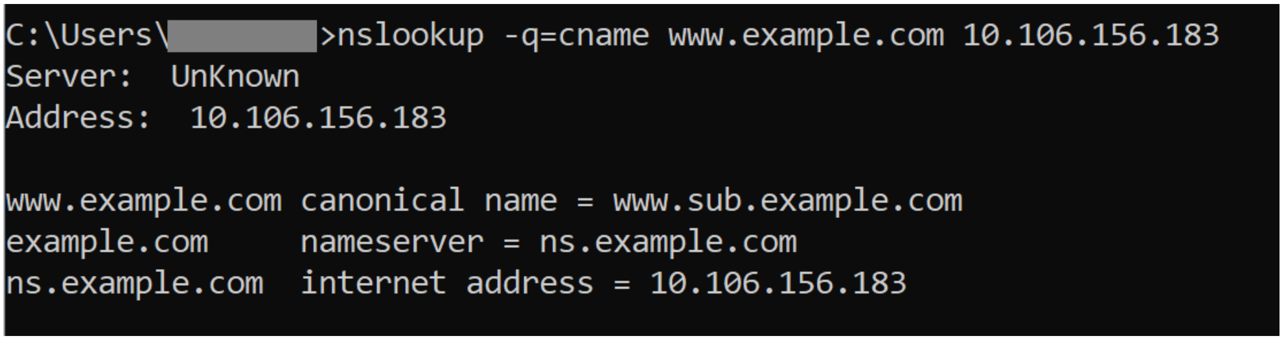
3. Test the CNAME record by query the Domain DNS server 10.106.156.183.

Linux - `dig`



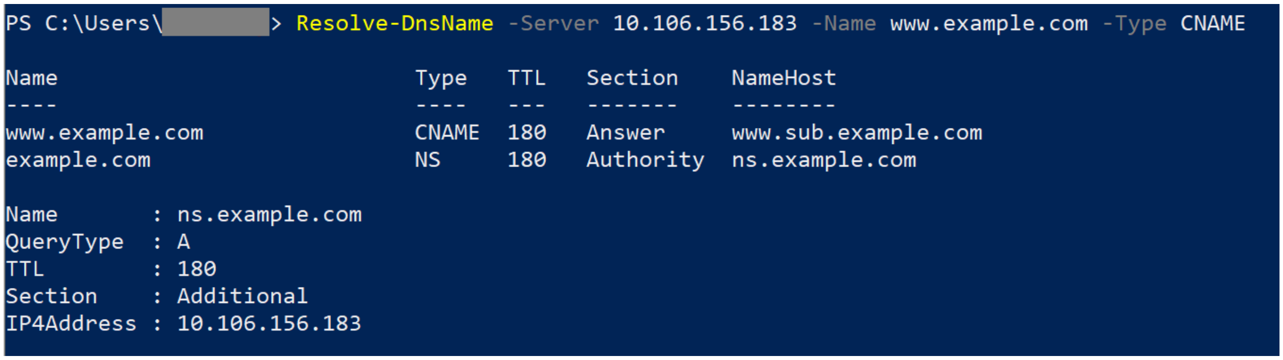
```
[root@localhost ~]# dig @10.106.156.24 www.example.com cname

; <<>> DiG 9.9.4-RedHat-9.9.4-72.el7 <<>> @10.106.156.24 www.example.com cname
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 43925
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.example.com.               IN      CNAME

;; ANSWER SECTION:
www.example.com.        34      IN      CNAME   www.sub.example.com.

;; Query time: 2 msec
;; SERVER: 10.106.156.24#53(10.106.156.24)
;; WHEN: Tue Jul 06 21:03:37 EDT 2021
;; MSG SIZE  rcvd: 66
```

Windows - `nslookup`



```
C:\Users\[redacted]>nslookup -q=cname www.example.com 10.106.156.183
Server:  UnKnown
Address:  10.106.156.183

www.example.com canonical name = www.sub.example.com
example.com     nameserver = ns.example.com
ns.example.com  internet address = 10.106.156.183
```

Windows - `Resolve-DnsName`



```
PS C:\Users\[redacted]> Resolve-DnsName -Server 10.106.156.183 -Name www.example.com -Type CNAME

Name                           Type   TTL   Section    NameHost
----                           ----   ---   -------    --------
www.example.com                CNAME  180   Answer     www.sub.example.com
example.com                    NS     180   Authority  ns.example.com

Name        : ns.example.com
QueryType   : A
TTL         : 180
Section     : Additional
IP4Address  : 10.106.156.183
```

a. If the test fails, check to see if the CNAME record conflicts with any other records in the Zone configuration.

How to add generic SD-WAN device to GSLB

Follow the steps to add the generic SD-WAN device to GSLB.

1. Create FQDN in **GSLB Services > Create FQDN Member > Create new Virtual Server Pool > Create new generic connector > Create new connector member** (add Generic SD-WAN device IP).
2. The virtual server from the generic SD-WAN connector will be added into Pool and Connector directly and will work in GSLB Services.

Example solution

This example assumes the following:

- You have two ISP routers.
- The generic SD-WAN has two members for each ISP. The SD-WAN will do the out-going load balance for App1 (as shown on the right side of the diagram). But sometimes,the incoming traffic may come always from ISP2, which means that the ISP2 link is very busy while ISP1 link is very free.
- The GSLB can load balance the incoming traffic to ISP1 link and ISP2 link from the DNS level, thus solving this issue.

Steps:

1. Create FQDN App1-www.fsdwan.com in GSLB services.

2. Create FQDN member > Create new Virtual Server Pool ISP1-pool > Create new generic connector sdwandevice > Create new Connector member VIP1-ISP1. Add generic SD-WAN device Virtual IP App1 ISP1 Public IP 202.0.20.21 and enable health check Default_HLTHCK_HTTP.
3. Create FQDN member > Create new Virtual Server Pool ISP2-pool > Select Connector sdwandevice > Create new Connector member VIP2-ISP2. Add generic SD-WAN device Virtual IP App1 ISP2 Public IP 54.20.0.22 and enable health check Default_HLTHCK_HTTP).
4. The virtual server from the generic SD-WAN device will be added into Pool and Connector directly and will work in GSLB services.

Sample topology view of GSLB

We have added 2 pools to perform the load balancing and each pool has a VIP.

After completing these steps, the customer can monitor the App1 status for both ISP1 link and ISP2 link on the FQDN service detail page. The GSLB will load balance the traffic to two links. If one of the links is down, the GSLB will direct the traffic to the available link. If both of the links are down, the GSLB will direct the traffic to the App1 default server.

How to set up the load balance method GEO

Perform the following steps to set up the load balance method GEO.

1. Create FQDN in GSLB Services and create an FQDN member.
2. Create a new Virtual Server Pool and use GEO preferred method in Pool.
3. Choose existing virtual servers for Pool. You can also create several new connectors with different Data Centers. Create new Connector member (Virtual Server) into Connectors.
4. The FQDN will respond to the DNS query according to the virtual server’s location in Connectors and the DNS query’s source IP.

Note: GEO method matches query’s source IP according to the data center of the connector that this virtual server belongs to. It will match country or continent if region is not matched. It will use Weight Round Robin if no continent matches.

For example: One virtual server with location US-California

Query’s source IP from US-Oregon will match it if no other virtual server locates in US-California.

Query’s source IP from Canada will match it if no other virtual server locates in US.

How to set up the load balance method DNS-Query-Origin

Perform the following steps to setup the load balance method DNS-Query-Origin.

1. Create FQDN in GSLB Services and choose DNS-Query-Origin as the Virtual Server Pool Selection Method.
2. Create multiple FQDN members.
    a. Click *Create Member* in FQDN and choose Virtual Server Pool.
    b. Click *Create Location List* and add location(s) to list (if needed).
    c. Click *Create Address Group* and then add the IP/Netmasks or IP ranges as address members (if needed).

    Create second Virtual Server Pool with other location(s) using the steps above.
3. Add the virtual servers into Virtual Server Pool. The FQDN will respond to the DNS query according to the Virtual Server Pool’s listed location(s) and DNS query’s source IP.

Note: If you want to use DNS-Query-Origin for matching Virtual Server Pool, all query source IP locations should be added to the location list or all corresponding IP/Netmasks or IP ranges should be added to the address group. Otherwise it uses Weight Round Robin method.

Example 1: Use only Location list

- Define one Location: *United_States*
- Assign Location United_States to virtual server pool: *Virtual_Server_Pool_US*
- Define second Location: *Germany*
- Assign Location Germany to virtual server pool: *Virtual_Server_Pool_Germany*

Result:

Queries from the United States will get replied from Virtual_Server_Pool_US, queries from Germany will get replied from Virtual_Server_Pool_Germany, queries other than these two countries will use Weight Round Robin between those two virtual server pools.

Example 2: Use Location list together with Address Group

Following the scenario set in *Example 1*, after having run the configuration for a while, you are finding that some particular source IP from the United States (here we are using 8.8.8.8 and 8.8.4.4 as an example) is not always getting replies from the Virtual_Server_Pool_US.

- Define an Address Group: *United_States_IPs* and add AddressNet 8.8.8.8/32 and AddressRange 8.8.4.4-8.8.4.4 as the members
- Assign Address Group *United_States_IPs* to virtual server pool *Virtual_Server_Pool_US*

Result:

Queries from 8.8.8.8 and 8.8.4.4 will also get replied from *Virtual_Server_Pool_US*.

Example 3: Use only Address Group

- Define one Address Group: *Google_Resolvers*
- Add AddressNet 8.8.8.8/32 and AddressRange 8.8.4.4-8.8.4.4 as the members
- Assign Address Group *Google_Resolvers* to virtual server pool *Pool_for_Google*
- Define another Address Group: *any_IP*
- Add AddressNet 0.0.0.0/0 as the member
- Assign Address Group *any_IP* to virtual server pool *Pool_General*

Result:

Queries from 8.8.8.8 and 8.8.4.4 will get replied from virtual server pool Pool_for_Google. Queries from other IP addresses will get replied from virtual server pool Pool_General.

Note: Although 8.8.8.8 and 8.8.4.4 are also included in the Address Group *any_IP*, the GSLB service is matching the virtual server pool by the sequence they are in the FQDN configuration. They will match the Address Group *Google_ Resolvers* first, and get replied from *Pool_for_Google*.

Example 4: Use city-level location list

- Define one Location: *CA_Sunnyvale*
- Assign Location *CA_Sunnyvale* to virtual server pool *Virtual_Server_Pool_CA_Sunnyvale*
- Define second Location: *CA_ Sacramento*
- Assign Location *CA_ Sacramento* to virtual server pool *Virtual_Server_Pool_CA_Sacramento*

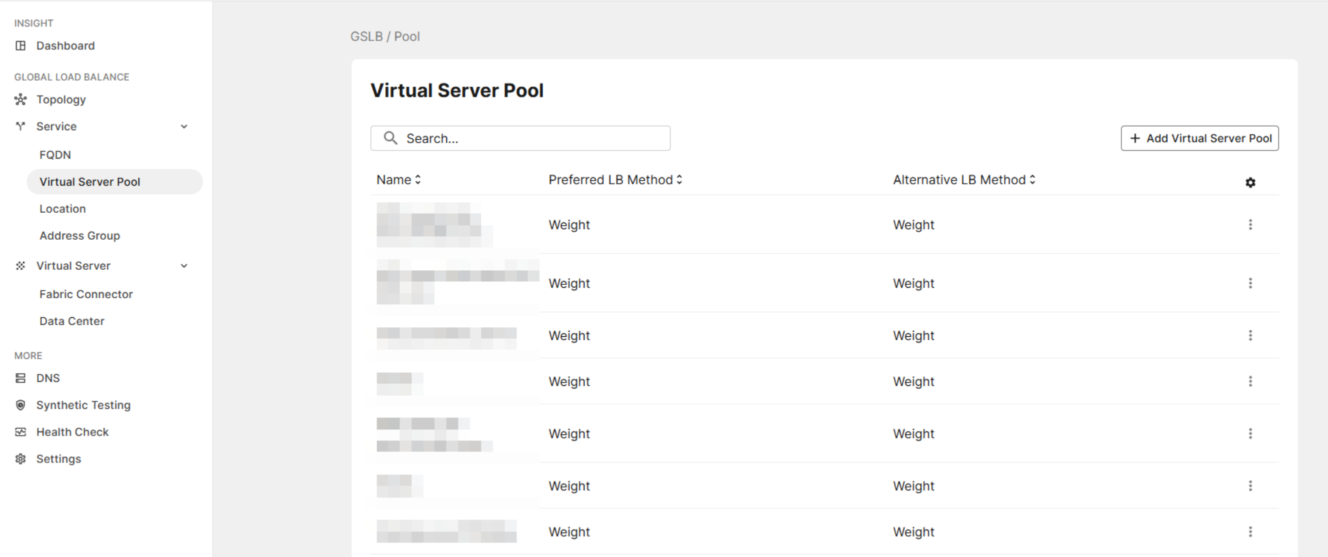
Result:

Queries from Sunnyvale will get replied from Virtual_Server_Pool_CA_Sunnvayle, queries from Sacramento will get replied from Virtual_Server_Pool_CA_Sacramento.

Virtual Server Pool

The Virtual Server Pool is a group of virtual servers that perform the same role on the network. The administrator puts the virtual servers with the same role into one pool. The administrator can also divide one pool into several sub pools according the geographic location.

For more information on virtual servers, please see Virtual Server on page 284.



Virtual Server Pool

Name	Preferred LB Method	Alternative LB Method
[redacted]	Weight	Weight
[redacted]	Weight	Weight
[redacted]	Weight	Weight
[redacted]	Weight	Weight
[redacted]	Weight	Weight
[redacted]	Weight	Weight
[redacted]	Weight	Weight

Add Virtual Server Pool

1. Click **Add Virtual Server Pool**.
2. Enter the following:

Settings	Guidelines
Name	Name of the pool
Preferred LB Method	The preferred Load Balancing (LB) method determines how traffic is distributed among virtual servers associated with a specific FQDN. **NONE**: The GSLB will not perform load balancing. **WEIGHT**: **GEO**: The GSLB will perform load balancing according the request's source geographic location. **Least-Connection** (FortiADC): The GSLB will load balance the traffic to the virtual server which has the least connections. **Connection-Limit** (FortiADC): The GSLB will perform load balancing according to the virtual servers' connection limit determined by the virtual servers' weight: the greater the weight of a virtual server, the more responses it will get. **Bytes-Per-Second** (FortiADC): The GSLB will load balance the traffic to the virtual server which has the least BPS. **Server-Performance** (FortiADC/FortiGate): The GSLB will load balance the traffic to the server which has the lowest load (memory and CPU). Virtual servers with better server-performance in the CPU or Memory (whichever one you give more weight to) will respond. **SDWAN-InBandwidth** (FortiGate): The GSLB load balances the traffic to the virtual server which has the lowest InBandwidth for the related SD-WAN gateway. **SDWAN-OutBandwidth** (FortiGate): The GSLB load balances the traffic to the virtual server which has the lowest OutBandwidth for the related SD-WAN gateway. **SDWAN-BiBandwidth** (FortiGate): The GSLB load balances the traffic to the virtual server which has the lowest sum of InBandwidth and OutBandwidth for the related SD-WAN gateway.
Alternate	Enable this option to specify a load balancing method to act as a backup if the primary method becomes unavailable or fails to meet necessary conditions, such as passing a health check. Refer above for a full list of load balancing methods and their descriptions.
Check Virtual Server Status	Enable/disable checks on whether the status of the virtual servers in the virtual server list is known. Virtual servers with unknown status are not selected for DNS answers.

3. Click **Add Virtual Server**. This opens a modal window.

Settings	Guidelines
Virtual Server	Select a virtual server that you have created to add it to this Pool. For information on how to configure Virtual Servers, please refer to
TTL	The Time to Live of the Resource Records, which defines how long DNS servers cache the server's details before refreshing. Lower TTL values allow quicker updates, while higher values reduce lookup frequency and improve caching efficiency. Default: 5; Range: -1 to 2147483647. When this value is -1, it means the virtual server will use the zone level TTL.
Weight	Assigns relative preference among virtual servers—higher values are more preferred and are assigned connections more frequently. The default is 1. The valid range is 1-255.
Backup	Enable to designate the member as a backup. Backup members are inactive until all main members are down.

4. Click **Save** to save the Virtual Server.
5. Click **Save** to save the Virtual Server Pool.

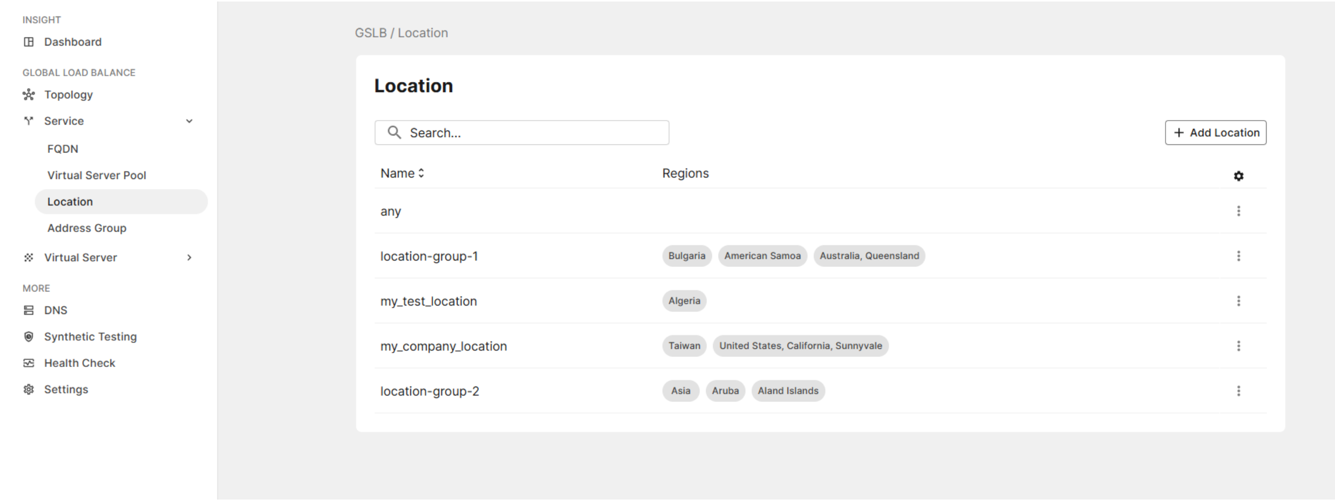
Location

The location object is a group of GeoIP regions. GSLB is able to detect requests from all countries and regions in the world and is accurate to the city level of G20 countries.

Each location object must contain at least one location record, with a maximum of 50 location records supported per location object.

When configuring multiple location records, ensure that each record specifies distinct GeoIP regions that do not overlap, otherwise it results in an invalid configuration. For example, if one record specifies the continent as Asia, and another record specifies the country as Japan; these two GeoIP regions would overlap as Japan is already a part of Asia, resulting in an invalid Location configuration.

After you have configured the location object, you can then use it as the location list in GSLB services. For more information, see FQDN on page 270.



GSLB / Location

Location

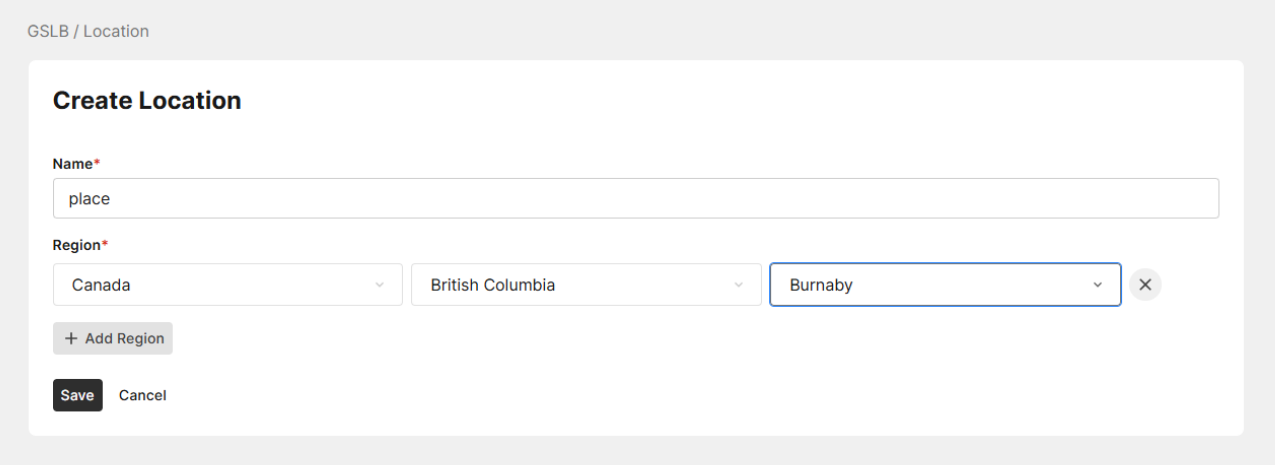
Name	Regions
any	
location-group-1	Bulgaria American Samoa Australia, Queensland
my_test_location	Algeria
my_company_location	Taiwan United States, California, Sunnyvale
location-group-2	Asia Aruba Aland Islands

Note: **any** is a predefined location object that includes all regions in the database by default.

To configure a location object:

1. Go to **GSLB > Service > Location**.
2. Click **Add Location** to display the configuration editor.

3. In the **Name** field, specify a unique name for the location configuration. Valid characters are `A-Z`, `a-z`, `0-9`, `_`, and `-`. No spaces. After you initially save the configuration, you cannot edit the name.
4. Click **Add Region** to add a location record. At least one **Region** must be added for a location object.



GSLB / Location

Create Location

Name*: place

Region*: Canada | British Columbia | Burnaby

5. Configure the following Location settings:

Setting	Description
Continent/Country	Specify the continent or country to include in the GeoIP region. The *Continent/Country* selection determines the availability of the *State* and *City* options.

Setting	Description
	ALL is the default option, which specifies that all continents/countries is included in this GeoIP region. **Note**: At minimum, a continent or country must be selected for a location record to be valid.
State/Province	Specify the state to include in the GeoIP region. The availability of *State* options is dependent on the selected *Continent/Country*. *ALL* is the default option, which specifies that all states under the specified continent/country is included in this GeoIP region.
City	Specify the city to include in the GeoIP region. The availability of *City* options is dependent on the selected *Continent/Country* and *State*. *ALL* is the default option, which specifies that all cities under the specified state is included in this GeoIP region.

6. Optionally, you can add multiple location records under the same location object, with up to 50 location records supported per single location object. However, a Location configuration becomes invalid if multiple location records share the same GeoIP region specification.
   Beware of the following scenarios that can result in this type of configuration conflict:
   - When separate location records specify regions that overlap, such as when both Asia and Japan are selected as the **Continent/Country**. As Japan is a part of Asia, the two GeoIP regions overlap.
   - When one of the location records is set as **ALL** for **Continent/Country**, **State**, and **City** levels. If the **Continent/Country** is set to **ALL**, then it would naturally overlap with any other location record that specifies a continent or country. However, by default, a location record is already invalid if **ALL** is set for **Continent/Country**.
7. Click **Save**.
   The new location object will be listed on the Location page.

Address group

The address group object is a group of IP intervals in the form of IP/Netmasks or IP ranges.

Create Address Group

1. Click Add Address Group
2. Enter the **Name** of the address group.
3. Click **Add Address Group member**. This opens a modal panel for configuring the Address Group Member's settings.
4. Select the Address Type, and enter the Net or Range.

   Address Net refers to an entire subnet or network of IP addresses, defined by a network address and a subnet mask.

   An example of an **Address Net** entry would be 10.0.0.0/24

   Address Range specifies a continuous range of IP addresses, usually defined by a starting and ending IP address.

An example of an **Address Range** entry would be: **Address Range Start:** 10.0.0.0, **Address Range End:** 10.0.0.255

Virtual Server

Manage connections between your FQDNs and external resources, such as fabric connectors and data centers.

There are two types of virtual servers:

- Fabric connector on page 284
- Data center on page 288

Fabric connector

Connectors in GSLB are linked to a physical device at the data center which houses virtual servers, from which the cloud can fetch all the virtual servers running information.

You can either create a connector manually in the FortiAppSec Cloud GUI, or enable a One-Click DNS service on a FortiADC/FortiGate/FortiWeb appliance, which will automatically create the connector and GSLB service.

Create Connector manually

1. Go to **Virtual Servers > Fabric Connectors** and click **Create Connector**.
2. Create a connector according to the following configuration.

Settings	Guidelines
Name	The name of the connector. **Note**: After you initially save the configuration, you can still edit the name later.
Type	GSLB can support three types of connectors: **1.** FortiGate The FortiGate Connector is for a FortiGate device. The administrator can edit the FortiGate Management IP address or FQDN, port, API version, sync control and authentication for the connector. Once the Fortigate Connector is configured, GSLB will sync the Virtual Server and SD-WAN configuration and run information from the FortiGate host periodically through RestAPI and update automatically. The administrator can specify the SD-WAN member name with the virtual server. The administrator can also create the virtual server manually or specify the health check for the virtual server. **2.** FortiADC A FortiADC instance that has enabled GSLB.

Settings	Guidelines
	The FortiADC type connetor is the FortiADC device that runs GSLB service. Once the device connects to the cloud, it will actively connect to the cloud. Then the connector object will be generated automatically, and the administrator will define the Virtual Servers' domains and hosts at the connector side in just one step. FortiADC will send the Virtual Servers' domains, hosts, running information to the cloud periodically, while the cloud will perform global servers load balancing automatically. The administrator can also create the virtual server manually or specify the health check for the virtual server. **3.** Generic-Host A third party FortiADC connector. The Generic-Host type connector is a third party host system that cannot communicate with the cloud directly. The administrator can add the host IP address on this server, and the administrator cloud can also specify the health check for the host. The cloud will detect the remote host automatically, then the administrator can configure the pool, the GSLB service. **4.** FortiWeb A FortiWeb instance that has enabled one-click GSLB service. The FortiWeb type connector is the FortiWeb device that enable GSLB service as fabric connector. Once the device connects to the GSLB, it will publish the polices with hosts and domains to GSLB, and GSLB will create connector object and GSLB service automatically. **5.** AWS The Fabric Connector is for AWS. The administrator can create a connector and virtual servers from a specified AWS region with the provided *Access Key* and *Access Secret.* **6.** AZURE The Fabric Connector is for AZURE. The administrator can create a connector and virtual servers from a resource group in a specified AZURE location using the provided *Tenant ID*, *Client ID*, *Client Secret* and *Subscription ID*.
Data center	Select a data center configuration object. The data center indicates the physical geography location of the connector.
Address type	IPv4 or FQDN
Address IPv4	FortiGate management IPv4 address
Address	FQDN address
Port	FortiGate administrative access port for HTTPS. Default: 443, Range: 1-65535
API version	The restful API version that GSLB can use when access FortiGate . Currently only v2 is supported
Sync control	User can configure to sync SD-WAN and/or Virtual Server configuration and running information from FortiGate. Default: SD-WAN. **Note:** The name of the synced SD-WAN and Virtual Server will use VDOM name as prefix, such as root-xxxx.
Auth type	The authentication method that GSLB can use when access FortiGate.

Settings	Guidelines
	Currently, Auth-Verify and Token authentication are supported. When Auth-Verify is chosen, user needs to provide username and password info; when Token is chosen, user needs to provide the RestAPI Key generated from FortiGate

3. After the FortiGate Connector is created, the Virtual Servers and SD-WAN member should be synced to GSLB within a couple minutes.

Notes & limitations:

- FortiGate Connector supports FortiGate hosts that run FortiOS version 6.2.5 or higher, due to the supported RestAPIs on FortiGate.
- FortiGate Connector supports Rest API version v2, this is the same Rest API version that FortiGate host currently supports. If in the future, FortiGate supports additional versions, FortiGate Connector will extend to support additional versions as well
- The FortiGate API token needed in FortiGate Connector token authentication can be generated on FortiGate using CLI. Below is an example of how to config an api-user and generate API key:

  ```
  config system api-user
     edit "g-api-rw-user"
        set api-key ENC SH2SHFEtfJQ9OsfH/keh4kdULAp3V4ps7HkxBuDIzpR4Cmsckaa9wJ6kw28dFQ=
        set accprofile "super_admin"
        set vdom "root"
        config trusthost
           edit 1
              set ipv4-trusthost 10.6.30.0 255.255.255.0
           next
        end
     next
  end
  execute api-user generate-key g-api-rw-user
  ```
- If Virtual Domains(VDOM) are enabled on FortiGate host, the RestAPI administrator configured for FortiGate Connector access should have access to all the VDOMs

Create a Generic-Host type connector

1. Go to **Fabric Connectors** and click **Create Connector**.
2. Create a connector according to the following configuration. For Type, select Generic-Host.

Settings	Guidelines
Name	The name of the connector. **Note**: After you initially save the configuration, you can still edit the name later.
Type	GSLB can support three types of connectors. Refer to the table under Create Connector manually on page 284 for details. For Generic-Host type, select "Generic-Host"
Data center	Select a data center configuration object. The data center indicates the physical geography location of the server.

3. Input a meaningful name for the connector, and select the Data Center or create a new one. Don't forget to save. Then, configure virtual servers according to Configuring virtual servers for connectors on page 287.

It is recommended to create only one Connector for each Data Center, unless you have a lot of services and IP addresses for this Data Center (which means you will have a lot of virtual servers, hundreds). In this case, you may need multiple Connectors. For easy management, it is recommended to create a Connector for each hardware device or a set of devices that running the similar service, or a set of devices that for one domain.

Note: The FortiADC type connector is automatically generated and available to use in GSLB once the user enables GSLB service on the FortiADC device. The user does not need to manually create this type of connector.

Configuring virtual servers for connectors

In the edit connector window, click "Create Member" to create a virtual server.

To configure the virtual server, input a virtual server name, and IP address. Enable the health check if needed. Virtual Server is allowed to enable multiple health checks for each virtual server with a simple and/or relationship.

Refer to the table below for details on virtual server configuration settings.

Settings	Guidelines
Name	Virtual server name Note: Usually, the service name or FQDN name is used for ease of identification. You may still edit it after you initially save the configuration.
Address Type	IPv4 or IPv6.
IP Address	Virtual server IP address.
Health Check Control	Enable health checking for the virtual server. Note: you must enable this option to configure the Health Check Relationship and Health Check List fields below.
Health Check Relationship	• AND—All of the specified health checks must pass for the virtual server to be considered available. • OR—One of the specified health checks must pass for the virtual server to be considered available.
Health Check List	Specify one or more health check configuration objects.
SD-WAN Link Name	Specify the SD-WAN member name for the virtual server, applicable to FortiGate type connector only. **Notes:** • The SD-WAN member should be in the same VDOM as the virtual server if the virtual server is synced from FortiGate • For a virtual server that is synced from a FortiADC or FortiGate, the synced attributes, such as name, ip address, and etc are not allowed to modify in GSLB.

It is recommended that you reuse the same Virtual Server for different GSLB services if they share the same IP. However, it is also reasonable to have multiple Virtual Servers with the same IP, which then may use different health check for different GSLB services.

Data center

The data center object is defined as the physical data center on the network, and its location item tells the cloud where the data center is located. Using the data center location information, the cloud can then perform proximity load balancing to direct all requests from the specified region to the data center.

To configure a data center object:

1. Go to **Virtual Server > Data Center**.
2. Click **Add Data Center** to display the configuration editor.
3. Configure the following Data Center settings:

Setting	Description
Name	Specify a unique name for the data center configuration. Valid characters are `A-Z`, `a-z`, `0-9`, `_`, and `-`. No spaces. After you initially save the configuration, you cannot edit the name.
Description	Optionally, describe the purpose of the configuration, to help you and other administrators more easily identify its use.
Region	
Continent/Country	Select the continent or country in which the data center is located. The *Continent/Country* selection determines the availability of the *State* and *City* options. To set the data center as a *country-level data center*, you can select the *Continent/Country*, and then set *State* and *City* as *ALL*. All requests from the specified continent or country will then be directed to this data center location. **Note**: Antarctica is the only continent selection that allows for *ALL* as an option for *State* and *City*.
State	Select the state in which the data center is located. The availability of *State* options is dependent on the selected *Continent/Country*. To set the data center as a *state-level data center*, you can select the *State*, and then set *City* as *ALL*. All requests from the specified state will then be directed to this data center location. Alternatively, you can select *ALL* to specify that requests from all states under the specified continent or country will be directed to this data center location, making this a *country-level data center*.
City	Select the city in which the data center is located. The availability of *City* options is dependent on the selected *Continent/Country* and *State*.

Setting	Description
	Select a city to set the data center as a *city-level data center*. All requests from the specified city will then be directed to this data center location. Alternatively, you can select *ALL* to specify that requests from all cities under the specified state will be directed to this data center location, making this a *state-level data center*.

4. Click *Save*.
   The new data center object will be listed on the Data Center page.

DNS service

This section covers the DNS services offered by FortiAppSec Cloud.

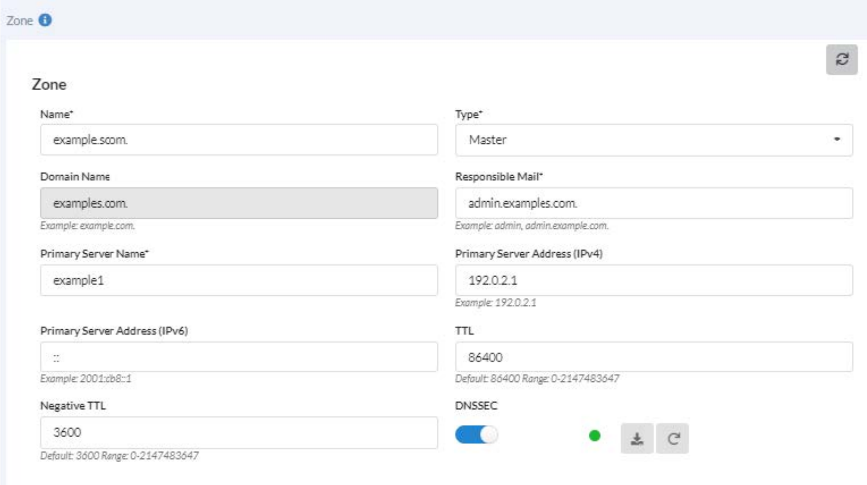
- DNS Resource Types on page 293
- How to create a DNS record on page 296
- How to enable DNSSEC on GSLB on page 296
- How to add GSLB as sub-domain on page 297

GSLB, functioning as a DNS Service, can support both standard DNS zones and primary type zones.

Adding a DNS Zone

1. Click **Add Service**
2. Configure the following:

Settings	Guidelines
Name	Name of the zone.
Type	Primary—The configuration contains the “primary” copy of data for the zone and is the authoritative server for it.
Domain name	The domain name must end with a period. For example: example.com.
Responsible Mail	Username of the person responsible for this zone, such as `admin.example.com`. **Note**: Format is mailbox-name.domain.com. (remember the trailing dot). The format uses a dot, not the @ sign used in email addresses because @ has other uses in the zone file. Email, however, is sent to admin@example.com.
Primary server name	Sets the server name in the SOA record.
Primary server address (IPv4)	The IPv4 address of the primary server. Note: The address will append on the 'ADDITIONAL SECTION' of the query reply. In most cases is the GSLB DNS server IP address.

Settings	Guidelines
Primary Server Address (IPv6)	The IPv6 address of the primary server. Note: The IPv6 address will append on the 'ADDITIONAL SECTION' of the IPv6 type query reply. If you have another DNS server hosting the same domain and it supports IPv6, then put that IPv6 address, otherwise leave it empty.
TTL	The $TTL directive at the top of the zone file (before the SOA) gives a default TTL for every RR without a specific TTL set. The default is 86,400. The valid range is 0 to 2,147,483,647.
Negative TTL	The last field in the SOA—the negative caching TTL. This informs other servers how long to cache no-such-domain (NXDOMAIN) responses from you. The default is 3600 seconds. The valid range is 0 to 2,147,483,647.
DNSSEC	Only enable DNSSEC when necessary. Click the **DNSSEC** toggle switch to enable DNSSEC, and then click **Save**. Wait at least 5 seconds before clicking the Refresh icon ⟳ at the top right corner. The DNSSEC Available dot indicator should now be green. The Download DNSSEC Certs icon ⤓ and Regenerate a set of DNSSEC certs icon ↻ buttons should now be accessible.  Zone Zone Name*: example.scom. Type*: Master Domain Name: examples.com. Example: example.com. Responsible Mail*: admin.examples.com. Example: admin, admin.example.com. Primary Server Name*: example1 Primary Server Address (IPv4): 192.0.2.1 Example: 192.0.2.1 Primary Server Address (IPv6): :: Example: 2001:db8::1 TTL: 86400 Default: 86400 Range: 0-2147483647 Negative TTL: 3600 Default: 3600 Range: 0-2147483647 DNSSEC: ● ⤓ ↻ After clicking the Download DNSSEC Certs button, an archive file is downloaded which contains the dsset key, zone-signing keys, and key-signing keys. After clicking Regenerate a set of DNSSEC certs button, A new group of dsset key, zone-signing keys, and key-signing keys will be generated and take effect. The old keys become invalid.

Settings	Guidelines
	Note: DNSSEC works with A/AAAA, CNAME, NS, MX, TXT, SRV and PTR records created in the Zone. It can also work with FQDN-generated A records, with the limitation that only one record will reply to the client for FQDN services.

3. If you have enabled **DNSSEC**, please see the following. If you have not enabled DNSSEC, feel free to skip this section.

   The **DSSET** (Delegation Signer Set) keys are used in DNSSEC to securely sign and validate the integrity of DNS records for domains, including those under sub-domains.

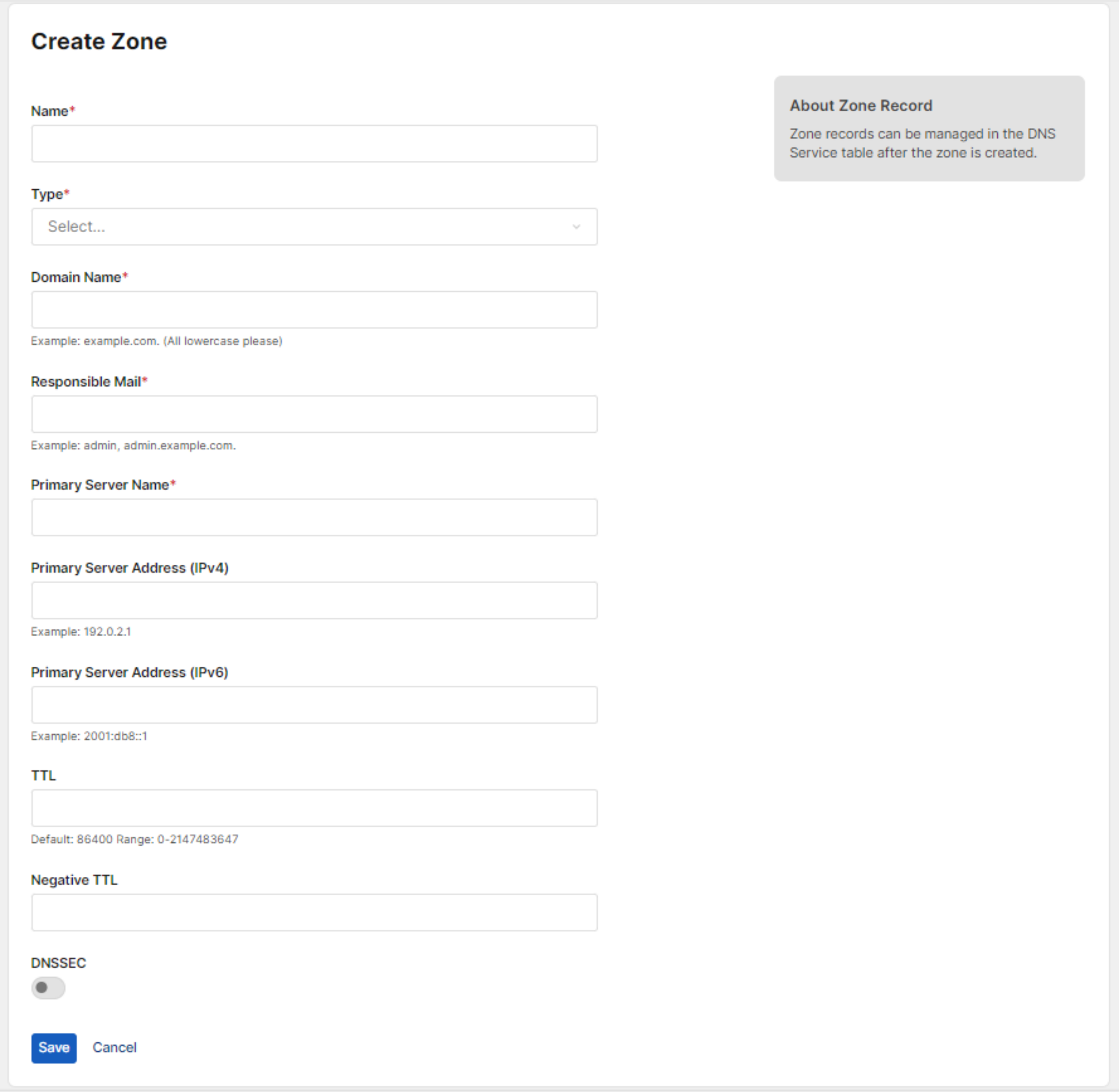
   Note: Corresponding NS record should already exist, when add a dsset. And key content must be valid. Failed to do so will result in the Zone reload fail and not respond to any query request.

   To configure DSSet, click **Add DSSet** and enter the following:

Settings	Guidelines
Name	Key name

Key	Paste the DSset file content. The content of DSset files is similar to the following:
	`dns.example.com. IN DS 21961 5 1 6E6C2D5EBF440DB2C71A8191FF2772F58A434175`
	`dns.example.com. IN DS 21961 5 2 1B000131FCC68FF34441A710ACACDFD67350CF962260F47309321F8D0551DADF`

Importing zone configuration files



Create Zone

About Zone Record

Zone records can be managed in the DNS Service table after the zone is created.

Name*

Type*

Select...

Domain Name*

Example: example.com. (All lowercase please)

Responsible Mail*

Example: admin, admin.example.com.

Primary Server Name*

Primary Server Address (IPv4)

Example: 192.0.2.1

Primary Server Address (IPv6)

Example: 2001:db8::1

TTL

Default: 86400 Range: 0-2147483647

Negative TTL

DNSSEC

Before importing a zone file in GSLB's DNS Services, ensure proper zone configuration.

Consider the following guidelines:

- Zone file must comply with RFC standards and BIND format.
- Record domain names in the zone file must match the hosted zone's name.
- GSLB ignores SOA records in the zone file.
- NS records and their corresponding A records for the configured zone domain are disregarded.
- The imported zone file must not duplicate any records already present in the hosted zone, or the import process will fail.
- Duplicate records in the imported zone file will also cause the import process to fail.
- You can import up to 1024 records.

Below is a sample zone file:

```
$TTL 86400
example.com. IN SOA ns1 admin (
   10004 ; serial
   3600 ; refresh
   900 ; retry
   3600000 ; expiry
   3600 ; minimum
)
example.com. IN NS ns1
$ORIGIN example.com.
ns1 86400 IN A 1.2.3.4
mail 86400 IN A 192.0.2.2
www 86400 IN A 192.0.2.1
www.example.com 86400 IN CNAME example.com.
sub.example.com 86400 IN MX 10 mail
```

DNS Resource Types

This section details resource types supported by GSLB:

- A/AAAA record on page 293
- CNAME record on page 294
- NS record on page 294
- MX record on page 294
- TXT record on page 295
- SRV record on page 295
- PTR record on page 296

In the future, secondary type zones should be available.

A/AAAA record

A host IPv4 or IPv6 address.

Configuring the A/AAAA record text field:

Settings	Guidelines
hostname	The hostname part of the FQDN, such as www. **Note**: You can specify the @ symbol to denote the zone root. The value substituted for @ is the preceding $ORIGIN directive.
Address type	IPv4 / IPv6
Address	Specify the IP address of the virtual server.
TTL	The time-to-live of the **Resource Records**
Weight	Assigns relative preference among members—higher values are preferred and are assigned connections more frequently. The default is 1. The valid range is 1-255.

CNAME record

Identifies the canonical name of an alias. Described in RFC 1035.

Configuring the CNAME record text field:

Settings	Guidelines
Alias	An alias name to another true or canonical domainname (the target). For instance, www.example.com is an alias for example.com. **Note**: Alias should not be the same as other records, nor should there be duplicate aliases for the same domain.
target	The true or canonical domain name. For instance, example.com.
TTL	The time-to-live of the **Resource Records**

NS record

The authoritative name server for the domain. Described in RFC 1035.

Configuring the NS record text field

Settings	Guidelines
Domain name	The domain for which the name server has authoritative answers, such as example.com. Note: FortiAppSec Cloud supports third-party domain names.
Host name	The hostname part of the FQDN, such as ns.
TTL	The time-to-live of the **Resource Records**
Address Type	IPv4 / IPv6
Address	Specify the IP address of the name server.

MX record

Identifies a mail exchange for the domain with a 16-bit preference value (lower is better) followed by the host name of the mail exchange. Described in RFC 974, RFC 1035.

Configuring the MX record text field

Settings	Guidelines
Domain name	The domain of the mail exchange server.
Hostname	The hostname part of the FQDN for a mail exchange server, such as mail.

Settings	Guidelines
TTL	The time-to-live of the **Resource Records**
Priority	Preference given to this RR among others at the same owner. Lower values have greater priority.
Address type	IPv4 / IPv6
Address	Specify the IP address.

TXT record

Described in RFC 1035.

Configuring TXT record / NS record

Settings	Guidelines
name	Hostname. TXT records are name-value pairs that contain human readable information about a host. The most common use for TXT records is to store SPF records.
text	Comma-separated list of name/value pairs. An example SPF record has the following form: `v=spf1 +mx a:colo.example.com/28 -all` If you complete the entry from the Web UI, do not put the string in quotes. (If you complete the entry from the CLI, you do put the string in quotes.)
TTL	The time-to-live of the **Resource Records**

SRV record

Information about well-known network services (replaces WKS). Described in RFC 2782.

Configuring the SRV record text field

Settings	Guidelines
Hostname	The host name part of the FQDN, e.g., www.
TTL	The time-to-live of the **Resource Records**
Priority	A priority assigned to the target host: the lower the value, the higher the priority.
Weight	A relative weight assigned to a record among records of the same priority: the greater the value, the more weight it carries.
Port	The TCP or UDP port on which the service is provided.
Target name	The canonical name of the machine providing the service.

PTR record

Resolves an IP address to a fully-qualified domain name.

Configuring the PTR record text field

Settings	Guidelines
PTR address	A PTR address, such as 10.168.192.in-addr.arpa. or 1. **Note**: If you use the number, the domain name is in the format "x.x.x.in-addr.arpa."
FQDN	A fully qualified domain name, such as "www.example.com".

How to create a DNS record

1. Configure the Zone for the SOA record.
   a. *Primary Server Name*: Name for the primary server. You will need this name when creating the NS record of your domain. If you use '@', this means the server name is exactly the same as the domain name. Make sure to add a '.' at the end of the name if you would like to name it with a different domain name, such as in 'example.com.'. If there is no '.' at the end, our server will append the domain name automatically as the server name.
   b. *Responsible Mail*: Use '.' to replace the '@' for the email address. If there is no '.' at the end of the mail, the DNS server will automatically append the domain name. For example, an input of 'dns_admin' would be automatically interpreted as 'dns_admin@sub.example.com'. Be sure to add a '.' at the end of the email address if a different domain name is used (e.g. 'dns_admin.example.com.').
2. Configure NS record
   a. Without '.' at the end of the Hostname: Requires an IP for the sub-domain. DNS will append the domain name automatically.
   b. With '.' at the end of the Hostname: No IP needed. Usually only used for redirecting to another domain.
3. Configure CNAME record
   CNAME Alias cannot conflict with any other record in the same domain. Otherwise, the DNS service will fail.
   a. Without '.' at the end of the Target: This means CNAME is within the same domain and the DNS server will append the domain automatically. TTL=-1 indicates use of the same TTL as the Zone configuration.
      If there is a valid A record for 'ms.sub.example.com'
   b. Without '.' at the end of the Target: CNAME will redirect to an A record in another domain.
      If there is a valid A record for 'mail.sub1.zw120.com' exists, then request from resolver '10.106.156.24'.

How to enable DNSSEC on GSLB

Before you begin:

Make sure your TLD supports DNSSEC.

Steps

1. If you have FQDN service only, you need to create a Zone service with the same Domain Name.
2. Toggle the DNSSEC on to enable (1). The indicator light (3), download button (4), and regenerate button (5) will then appear.
3. Click the refresh button (2) to refresh the Zone page so that the indicator light turns green. This should take less than one minute.
   Note: If you have any concern that your key has been compromised, you can click the regenerate button to regenerate the DNSSEC key files and then click the refresh button so that the indicator light turns green. Then proceed to the following steps and update your TLD.
4. Click the download button to download the DNSSEC key files.
5. Unzip the downloaded key files and open the file name that begins with 'dsset'. You may need this for your TLD.
   a. Add the file to the DSSET list.
   b. In Zone configuration, select the item from the DSSET List.
6. You should now be able to query the domain records with the DNSSEC flag. The resulting output should contain an 'ad' flag and a RRSIG record.
   Linux - `dig`
   Windows - `Resolve-DnsName`

Debugging

See Debugging on page 298 section in How to Add GSLB as sub-domain.

How to add GSLB as sub-domain

Example: You have a domain configured on a FortiADC as 'example.com'. You want the sub-domain "sub.example.com' to be configured on GSLB with the name of this sub-domain's primary server name to be 'ns-4.sub.example.com'. The resolver address is '10.106.156.24' and the FortiADC DNS server address is '10.106.156.183'. The sub-domain DNS server address provided by GSLB is '10.106.33.120'.

Steps

1. To configure the sub-domain on GSLB, go to *DNS Services* and *Click Create DNS services* or *Create New*.
   a. *Domain Name*: full sub-domain name with '.' at the end
   b. *Primary Server Name*: primary server name without domain name at the end
   c. *Primary Server Address*: DNS server address

   d. Add an A record for testing. In this example, a 'www' A record is configured with IP '10.107.9.81'

2. To configure an NS record on FortiADC, go to *Global Load Balance > Zone Tools > Zone*. Click on the zone to edit. Click Create New and select NS Record.
   a. *Domain Name*: The sub-domain name without 'example.com.'
   b. *Host Name*: The sub-domain's Primary Server Name without 'example.com'
   c. *Address*: The IP address of the sub-domain's DNS server

3. Verify the configuration by querying the resolver '10.106.156.24'.
   Recommendation: `dig` for Linux; `nslookup` or `Resolve-DnsName` for Windows.
   If done correctly, the output should look like the following:

   At this point, you should be able to get the A record resolved from the Google resolver '8.8.8.8'

Debugging

If verification fails, the user will need to debug according to the steps below:

Debugging on Linux

1. Try querying the sub-domain DNS server ‘10.106.33.120’ directly for the A record.
   a. If the query fails, you may need to reconfigure your sub-domain Zone. Try deleting some of the other records and query again. **Note**: The configure changes may take a few minutes to take effect.
2. Try querying the domain NS server '10.106.156.183' for the NS record.
   a. If the query fails, double check your FortiADC Zone records configuration, paying particular attention to the other NS records and CNAME records for potential conflicts.
3. Double check the domain NS record and Zone configuration. They should match with the query results.
4. If all checks were successful but the resolver still cannot resolve 'www.sub.example.com', check your network. You can also try to query the NS record from the resolver and query the A record from the domain DNS server to determine which part may have caused the failure.
   Note: In order to query the sub-domain A record from the domain DNS server, you need to enable *Recursion* within FortiADC Policy settings.

Debugging on Windows using `nslookup`

1. Try querying the sub-domain DNS server '10.106.33.120' directly for the A record.
   a. If the query fails, you may need to reconfigure your sub-domain zone. Try deleting some of the other records and querying again. **Note**: The configure changes may take a few minutes to take effect.
2. Try querying the domain DNS server '10.106.156.183' for the NS record.
   a. If the query fails, double check the FortiADC Zone records configuration, paying particular attention to the other NS records and CNAME records for potential conflicts.
3. Double check the domain NS record and Zone configuration. You can also check the SOA record from the sub-domain DNS server and NS record from the domain DNS server.
4. If all checks were successful but the resolver still cannot resolve 'www.sub.example.com', check your network. You can also try to query the NS record from the resolver and query the A record from the domain DNS server to determine which part may have caused the failure.
   Note: In order to query the sub-domain A record from the domain DNS server, you need to enable *Recursion* within FortiADC Policy settings.

Debugging on Windows using `Resolve-DnsName`

1. Try querying the sub-domain DNS server '10.106.33.120' directly for the A record.
   a. If the query fails, you may need to reconfigure your sub-domain zone. Try deleting some of the other records and querying again. **Note**: The configure changes may take a few minutes to take effect.
2. Try querying the domain DNS server '10.106.156.183' for the NS record.
   a. If the query fails, double check the FortiADC Zone records configuration, paying particular attention to the other NS records and CNAME records for potential conflicts.
3. Double check the domain NS record and Zone configuration. They should match with the query results.
4. If all checks were successful but the resolver still cannot resolve 'www.sub.example.com', check your network. You can also try to query the NS record from the resolver and query the A record from the domain DNS server to determine which part may have caused the failure.
   Note: In order to query the sub-domain A record from the domain DNS server, you need to enable *Recursion* within FortiADC Policy settings.

Synthetic testing

Synthetic testing checks applications availability by sending probes to applications from GSLB. It can be used to monitor application website services or application endpoints at various network layer, and the results of these tests can provide valuable information on application up/down time, availability, and regional performance issues.

Synthetic testing types

Synthetic testing supports ICMP, HTTP, HTTPS, DNS, TCP, UDP and TCP Echo testing. It utilizes the health check object configured under *Profiles* > *Health Check*.

Configuring application

Go to *Synthetic testing* and click *Create New*. Create an application according to the following configuration settings:

Setting	Description
Name	Application name
Address Type	IPv4, IPv6, or FQDN
IP Address	Application IP address
Address	FQDN address
Region	The physical location of the application
Health Check Control	Enable health checking for the application. **Note**: you must enable this option to configure the Health Check Relationship and Health Check List fields below.
Health Check Relationship	AND—All of the specified health checks must pass for the application to be considered available.

Setting	Description
	OR—One of the specified health checks must pass for the application to be considered available.
Health Check List	Specify one or more health check configuration objects.

Viewing testing results

Synthetic testing is activated within 1 minute after the testing is setup. The time needed for results to become available depends on your health check configures (for instance, Up Retry, Down Retry, Timeout and Interval). You can refresh and view Synthetic testing results in the GUI as a Map or as a List by selecting the desired view at the top left. You can also view testing related activities and logs in *Recent Activities*.

In *Map* view, get detailed application info for specific regions by hovering over the region or clicking the region icon.

How to set up synthetic testing for multisite applications

Scenario: The client has web service applications located in several different regions (United State, Arizona; Italy, Enna; etc). The client wants to proactively monitor the web services in all these regions and check whether the web services are responding to requests. They also want to manage the web services reachability issue from a region perspective. To achieve this goal, the client can set up HTTP synthetic testing on their applications.

Steps

1. Go to *Profile* > *Health Check* and create a HTTP type health check.
2. From *Synthetic Testing*, click *Create New* to create an application. Specify the name, IP address of the application, and region. Enable health check and then select the health check configured in step 1. Applications in other regions can be created in similar steps.
3. You can view the testing result as a *Map* or as a *List* by selecting the desired view at the top left. Region location and status data can be conveniently viewed from *Map* view. You can get testing activities and logs from *Recent Activities*.

Health check

In Global Server Load Balance (GSLB) deployments, the system uses health checks to poll the virtual servers to test whether or not the virtual server is available. In this profile, you can include results from multiple health checks. For example, you can configure an HTTP health check test and a TCP health check test.

Predefined health check configuration objects describe the predefined health checks. You can get started with these or create custom objects.

Predefined health check configuration objects

Predefined	Description
LB_HLTHCK_HTTP	Sends a HEAD request to the server port 80. Expects the server to return an HTTP 200.
LB_HLTHCK_HTTPS	Sends a HEAD request to the server port 443. Expects the server to return an HTTP 200.
LB_HLTHCK_ICMP	Pings the server.
LB_HLTHCK_TCP_ECHO	Sends a TCP echo to server port 7. Expects the server to respond with the corresponding TCP echo.

Before you begin

- You must have a good understanding of TCP/IP and knowledge of global load balance.
- You must know the IP address, port, and configuration details for the local load balance servers.
- For some protocol checks, you must specify user credentials.
- You must have Read-Write permission for Load Balance settings.
- After you have configured a health check, you can select it in virtual server configuration.

To configure a health check

1. Go to Health Check, click **Create New** to display the configuration editor.
2. Select one of the following options:
   - ICMP
   - TCP Echo
   - TCP
   - HTTP
   - HTTPS
   - UDP
   - DNS
3. Complete the configuration as described in Health check configuration.
4. Save the configuration.

Setting	Guidelines
Name	Configuration name. Valid characters are A-Z, a-z, 0-9, _, and -. No spaces. After you initially save the configuration, you cannot edit the name.
Type	Select a type of health check.
General	
Destination Address Type	IPv4

Setting	Guidelines
IPv4 Address	The IPv4 address to send health check traffic. If you do not specify an IPv4 address, the virtual server IPv4 address is used.
Interval	Seconds between each health check. Should be more than the timeout to prevent overlapping health checks. The default is 30.
Timeout	Seconds to wait for a reply before assuming that the health check has failed. The default is 10.
Up Retry	Attempts to retry the health check to see if a down server has become available. The default is 1.
Down Retry	Attempts to retry the health check to see if an up server has become unavailable. The default is 3.
Specifics	
TCP / UDP	
Port	Listening port number of the virtual server.
HTTP / HTTPS	
Port	Listening port number of the virtual server. Usually HTTP is 80, HTTPS is 443. If testing an HTTP proxy server, specify the proxy port.
SSL Ciphers	For HTTPS only. Default selections are recommended.
Local Cert	For HTTPS only. Paste the local SSL Health Check Client certificate into the blank.
HTTP CONNECT	Specify an HTTP CONNECT option: • Local CONNECT—Use HTTP CONNECT to test the tunnel connection through the proxy to the remote server. The virtual server is deemed available if the request returns status code 200 (OK). • Remote CONNECT—Use HTTP CONNECT to test both the proxy server response and remote server application availability. If you select this option, you can configure an HTTP request within the tunnel. For example, you can configure an HTTP GET/HEAD request to the specified URL and the expected response. • No CONNECT—Do not use the HTTP CONNECT method. This option is the default. The HTTP CONNECT option is useful to test the availability of proxy servers only.
Remote Host	If you use HTTP CONNECT to test proxy servers, specify the remote server IP address.
Remote Port	If you use HTTP CONNECT to test proxy servers, specify the remote server port.
Method Type	HTTP method for the test traffic: • HTTP GET—Send an HTTP GET request to the server. A response to an HTTP GET request includes HTTP headers and HTTP body. • HTTP HEAD—Send an HTTP HEAD request. A response to an HTTP HEAD request includes HTTP headers only.
Send String	The request URL, such as /contact.php.

Setting	Guidelines
Receive String	A string expected in return when the HTTP GET request is successful.
Status Code	The health check sends an HTTP request to the server. Specify the HTTP status code in the server reply that indicates a successful test. Typically, you use status code 200 (OK). Other status codes indicate errors.
Match Type	What determines a failed health check? • Match String • Match Status • Match All (match both string and status) Not applicable when using HTTP HEAD. HTTP HEAD requests test status code only.
DNS	
Domain Name	The FQDN, such as www.example.com, to use in the DNS A/AAAA record health check.
Address Type	IPv4
Host Address	IP address that matches the FQDN, indicating a successful health check.

Integrating GSLB into the Fortinet Security Fabric

This section details the following use cases for GSLB.

For information on connectors, see Fabric connector on page 284

- Setting up an FQDN with Generic-Host connector on page 304
- FortiADC Integration with One-Click GSLB on page 305
- FortiGate Integration on page 310
- FortiWeb Integration with One-Click GSLB on page 317
- Fabric connectors with AWS and Azure on page 321

Setting up an FQDN with Generic-Host connector

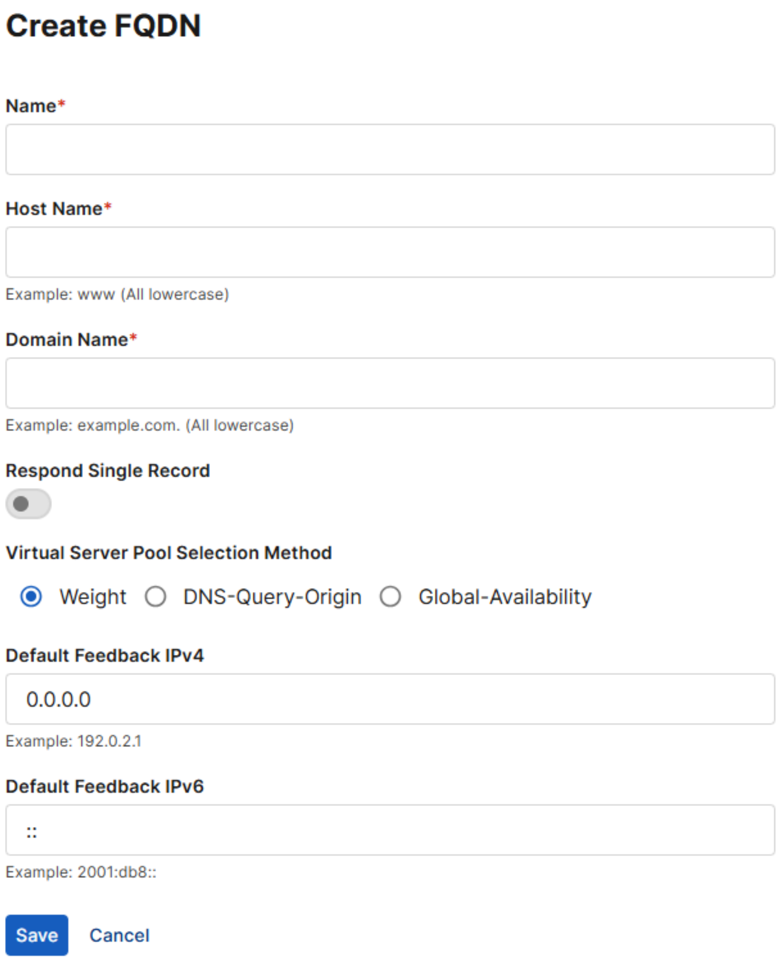
The Generic-Host type connector is a third party host system that cannot communicate with the cloud directly.

The administrator can add the host IP address on this server and specify the health check for the host. The cloud will automatically detect the remote host, after which the administrator can configure the pool and the GSLB service.

Configuration Steps

Perform the following steps to add an FQDN with generic-host connector.

1. Navigate to **GSLB > Virtual Server > Fabric Connector**, and click **Add Connector**. For detailed configuration information, please see Create a Generic-Host type connector on page 286.
2. Navigate to **Service > FQDN** and click **Add FQDN**. Enter FQDN information and save. For detailed configuration information, please see Creating an FQDN on page 270.



Create FQDN

Name*

Host Name*

Example: www (All lowercase)

Domain Name*

Example: example.com. (All lowercase)

Respond Single Record

Virtual Server Pool Selection Method

● Weight ○ DNS-Query-Origin ○ Global-Availability

Default Feedback IPv4

0.0.0.0

Example: 192.0.2.1

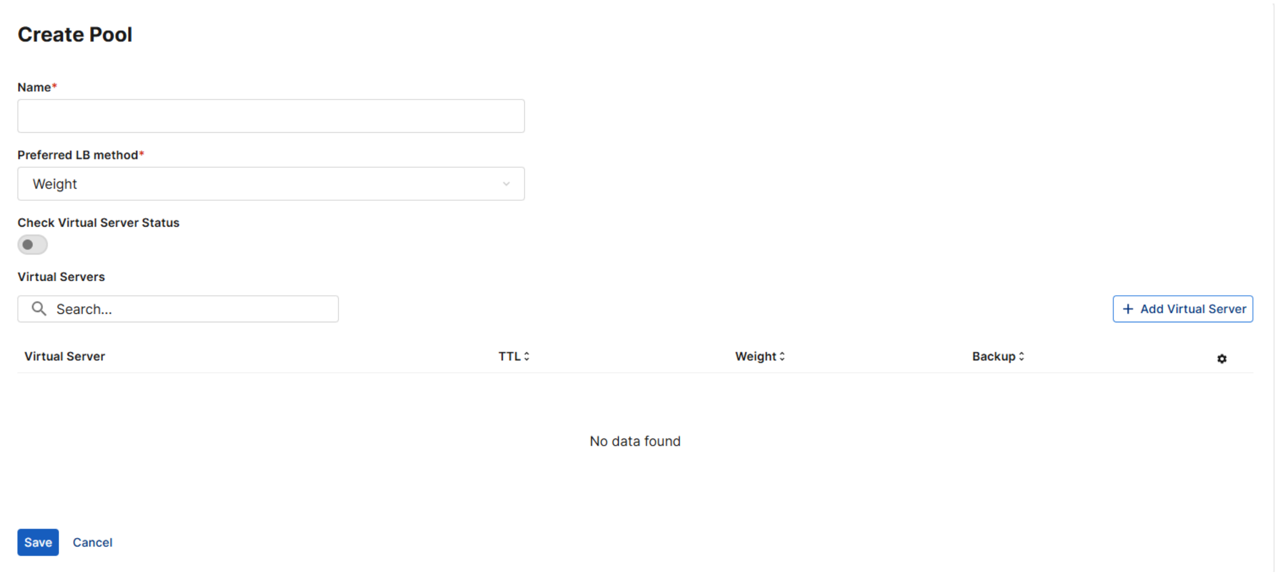
Default Feedback IPv6

::

Example: 2001:db8::

Save Cancel

3. Go to **Server > Virtual Server Pool** to create a new Virtual Server Pool. For detailed configuration instructions, please seeAdd Virtual Server Pool on page 280



Create Pool

Name*

Preferred LB method*: Weight

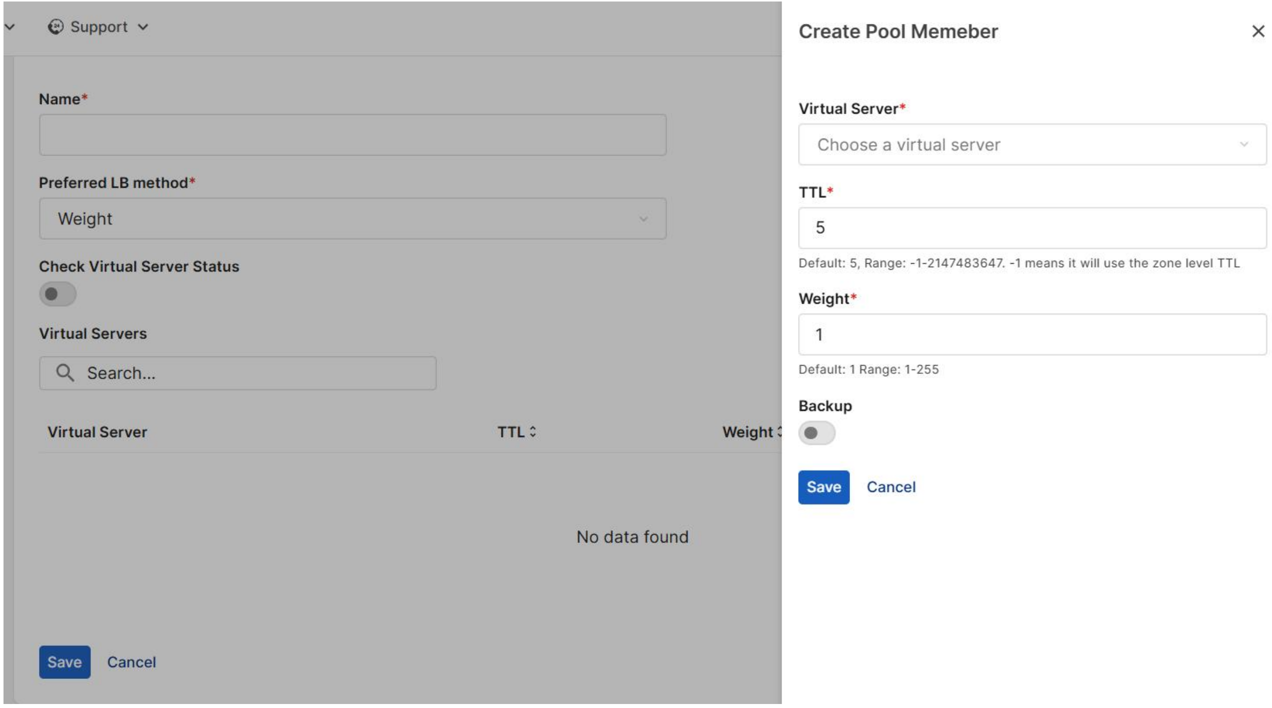
Check Virtual Server Status

Virtual Servers

Virtual Server	TTL	Weight	Backup

No data found

4. After saving the Pool, create a member (virtual server) into Pool.
5. Click **Create Virtual Server**.
6. Under Virtual Server, select the connector you created in step 1.



Create Pool Memeber

Virtual Server*: Choose a virtual server

TTL*: 5

Default: 5, Range: -1-2147483647. -1 means it will use the zone level TTL

Weight*: 1

Default: 1 Range: 1-255

Backup

7. The virtual server should be added successfully into Pool. Click **Save**. The Virtual Server Pool is also added successfully into FQDN.

FortiADC Integration with One-Click GSLB

Perform the following steps to configure GSLB. This section is split into two parts:

- New customers on page 306—for customers who are new to GSLB.
- Returning customers on page 308—assumes you already know how to enable GSLB.

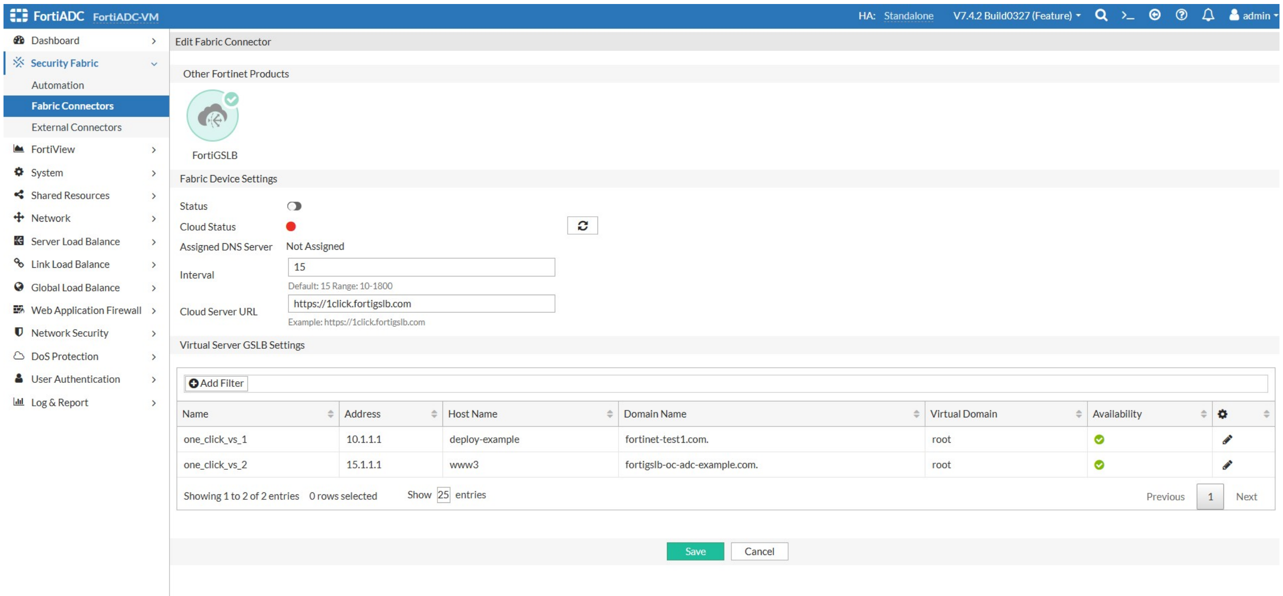
New customers

Follow the steps to set up GSLB for the first time.

Link the FortiADC to GSLB

The FortiADC device must be registered. Check this under **FortiADC > System > FortiGuard > Support Contract > Registration**.

1. Log into FortiADC.
2. Navigate to **Security Fabric > Fabric Connectors > GSLB**) Click **edit** on the far right. Here you will connect FortiADC to GSLB.



Edit Fabric Connector

Fabric Device Settings

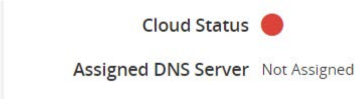
Status ○
Cloud Status ●
Assigned DNS Server Not Assigned
Interval 15
Default: 15 Range: 10-1800
Cloud Server URL https://1click.fortigslb.com
Example: https://1click.fortigslb.com

Virtual Server GSLB Settings

Name	Address	Host Name	Domain Name	Virtual Domain	Availability	⚙
one_click_vs_1	10.1.1.1	deploy-example	fortinet-test1.com.	root	✓	✎
one_click_vs_2	15.1.1.1	www3	fortigslb-oc-adc-example.com.	root	✓	✎

Showing 1 to 2 of 2 entries 0 rows selected Show 25 entries Previous 1 Next

3. Configure basic settings.
   a. Set **status** to on - on/off (enable/disable GSLB service)
   b. Set the **interval** to the default (15) - How often the FortiADC will attempt to connect to the One-Click Cloud Server.
   c. Set the **Cloud Server URL** to the default (https://1click.fortigslb.com) - URL of the One-Click Cloud Server.
4. Click **Save**.



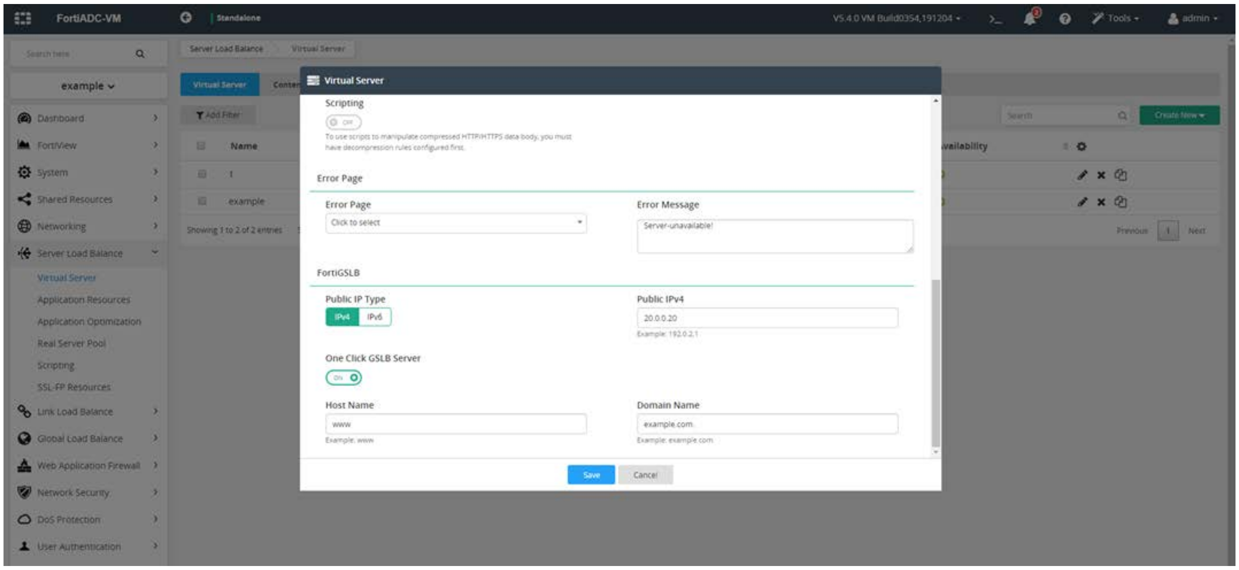
Cloud Status ●
Assigned DNS Server Not Assigned

Ensure the Cloud Status on the top is green. Green means the connection has succeeded, whereas red indicates failure. The Assigned DNS Server shows the DNS server address. "Not assigned" means the DNS Server is not assigned.

If it is red, moving the cursor onto it will result in an error message showing up.

There may be some lag time. Refresh if necessary.

5. In a second browser tab/window, log into FortiAppSec Cloud, and navigate to GSLB. Refresh the page to check if your organization now appears on the Management Console dashboard. The default organization is labeled 'Default.' For details on the current dashboard, refer to the GUI Dashboards section.
6. Return to **FortiADC > root > Server Load Balance > Virtual Server**. Create a virtual server with GSLB enabled and set the Host/Domain name. Go to **General** and enable the One Click GSLB Server. This will reveal the Host Name and Domain Name.



Virtual Server

Scripting
OFF
To use scripts to manipulate compressed HTTP/HTTPS data body, you must have decompression rules configured first.

Error Page

Error Page: Click to select
Error Message: Server-unavailable!

FortiGSLB

Public IP Type: IPv4 | IPv6
Public IPv4: 20.0.0.20
Example: 192.0.2.1

One Click GSLB Server
ON

Host Name: www
Example: www
Domain Name: example.com
Example: example.com

Save | Cancel

7. After you save, the virtual server's information will show in **WAF > System > Settings > GSLB** (or **WAF > Security Fabric > Fabric Connectors > GSLB** for FortiADC releases 6.0 and above). Your virtual servers should show up at the bottom under Virtual Server. If configured correctly, the FortiADC will send the IP addresses, host name and domain name to GSLB, which will then load-balance with these virtual servers.

If over 50 virtual servers have enabled GSLB, we recommend using at least 30 seconds as GSLB's interval.

View virtual servers in GSLB

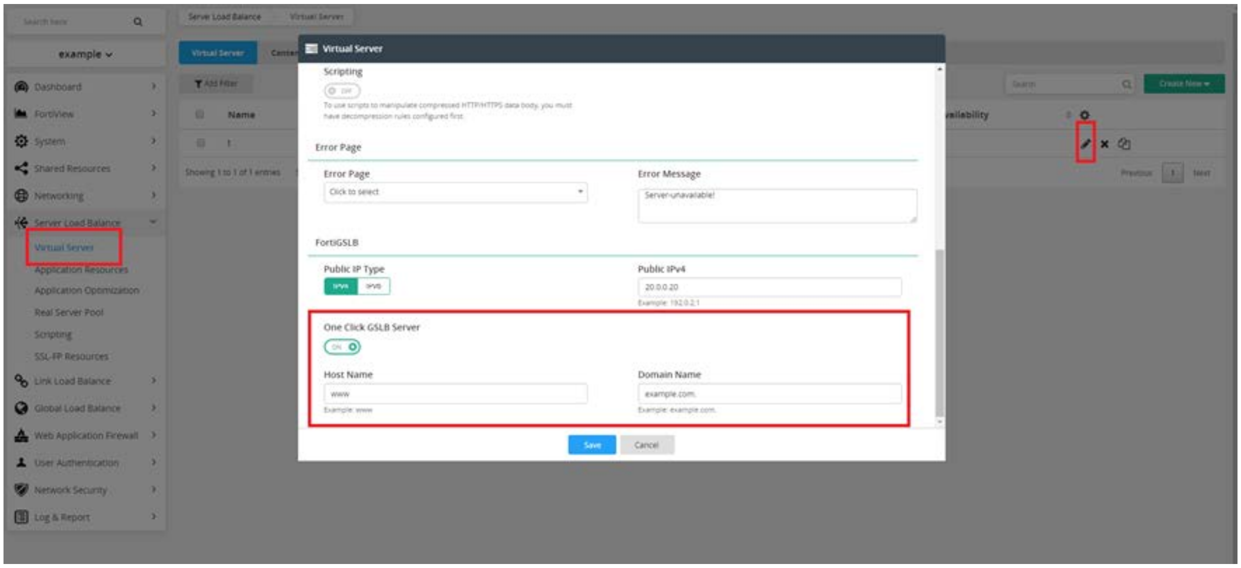
1. Go to GSLB and click into individual organization. In this example we are selecting the default organization, "default". We will see the virtual servers in GSLB.
2. In the individual organization, go to **Fabric Connectors**. The name is the FortiADC serial number. The type is FortiADC. The data center is the default or the first data center you already configured in Cloud. Click **edit** and you will see your virtual servers. **Note:** The load balancing may take a little while to start when the "green" is lit in the FortiADC.
3. In **Profiles > Pool** you will see the automatically generated virtual server pools that the Cloud has done for you. Click **edit** on the far right to see the IP addresses of the virtual servers. They are pooled according to your PREFERRED method. See the Virtual Server Pool on page 279 section for more information.

Returning customers

This section assumes that you have already enabled GSLB and know how to create new virtual servers with GSLB enabled.

To add more virtual servers into GSLB and support certain services:

1. Go to **FortiADC > Server Load Balance > Virtual Server > edit Virtual Server > General > Enable One Click GSLB Server** and enter Host/Domain Name.



Scripting: OFF

To use scripts to manipulate compressed HTTP/HTTPS data body, you must have decompression rules configured first.

Error Page

Error Page: Click to select

Error Message: Server-unavailable!

FortiGSLB

Public IP Type: IPv4 | IPv6

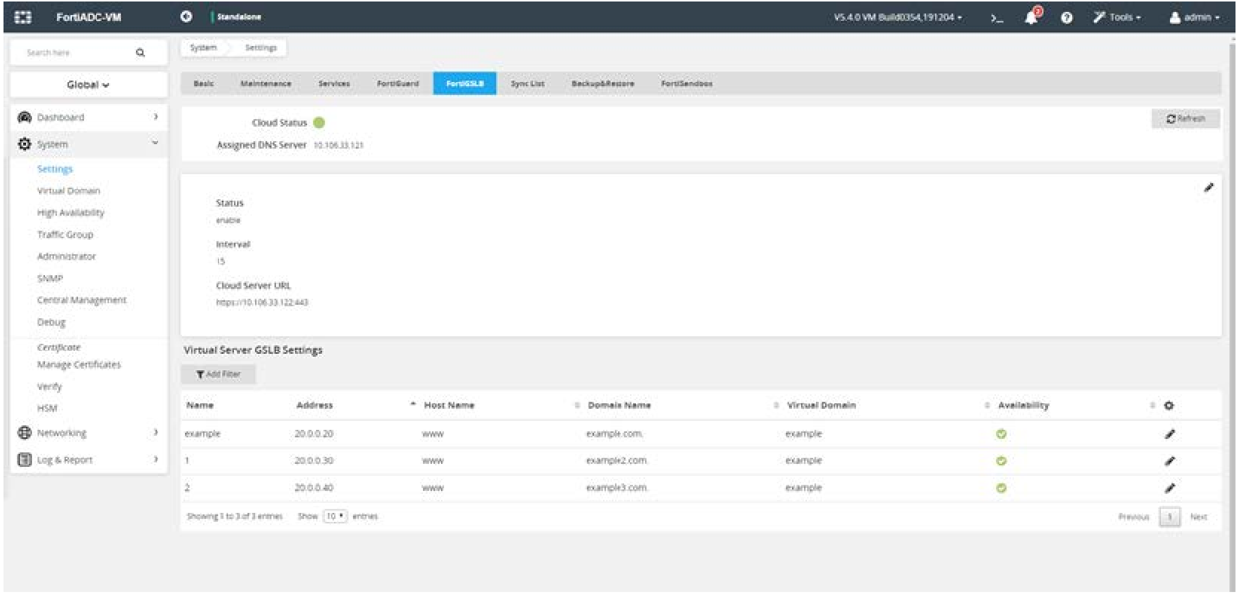
Public IPv4: 20.0.0.20 (Example: 192.0.2.1)

One Click GSLB Server: ON

Host Name: www (Example: www)

Domain Name: example.com. (Example: example.com.)

2. After you save, all the virtual servers that enabled GSLB will show up in the list.



Cloud Status ●

Assigned DNS Server 10.106.33.121

Status: enable

Interval: 15

Cloud Server URL: https://10.106.33.122:443

Virtual Server GSLB Settings

Name	Address	Host Name	Domain Name	Virtual Domain	Availability
example	20.0.0.20	www	example.com.	example	✓
1	20.0.0.30	www	example2.com.	example	✓
2	20.0.0.40	www	example3.com.	example	✓

Showing 1 to 3 of 3 entries Show 10 entries Previous 1 Next

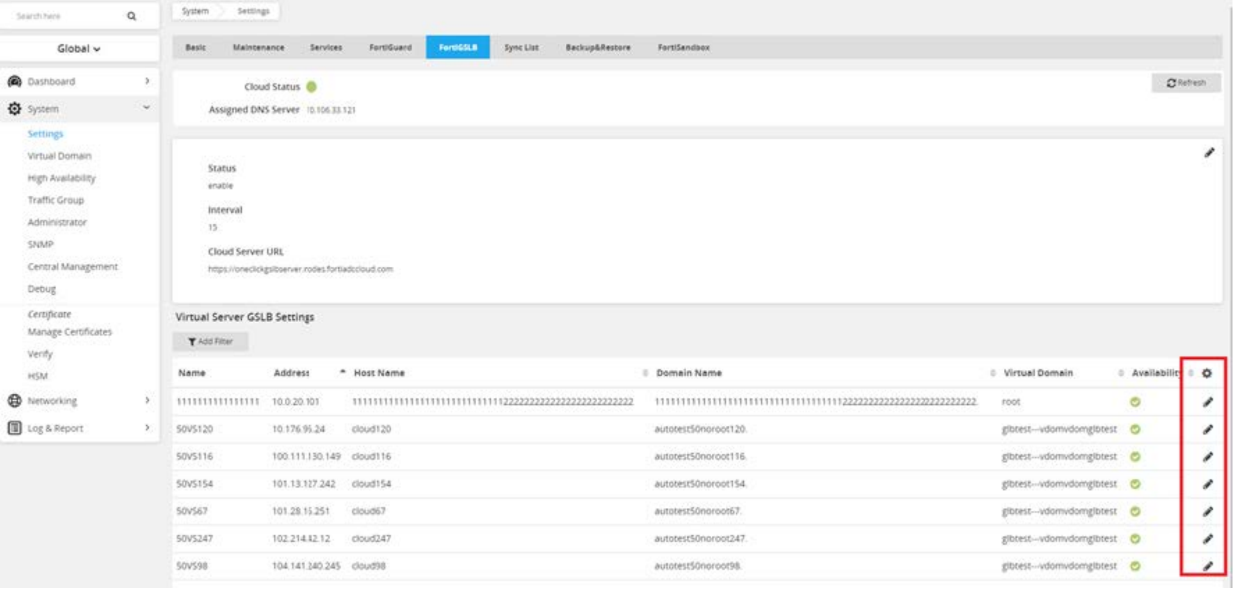
Further steps for modifications:

If you want to modify FQDN host/domain name or disable Virtual Server GSLB function, there are two ways.

Method 1

Go to GSLB to edit the virtual server that has already enabled GSLB.

From GSLB 2.0.0, FortiADC supports editing the virtual server directly inside the FortiADC GSLB module.



Cloud Status ●

Assigned DNS Server 10.106.33.121

Status
enable

Interval
15

Cloud Server URL
https://oneclickgslbserver.rodes.fortiadccloud.com

Virtual Server GSLB Settings

Name	Address	Host Name	Domain Name	Virtual Domain	Availability	⚙
1111111111111111	10.0.20.101	11111111111111111111111111111122222222222222222222222222	11111111111111111111111111111111111111122222222222222222222222222.	root	✓	✎
50VS120	10.176.95.24	cloud120	autotest50noroot120.	glbtest---vdomvdomglbtest	✓	✎
50VS116	100.111.130.149	cloud116	autotest50noroot116.	glbtest---vdomvdomglbtest	✓	✎
50VS154	101.13.127.242	cloud154	autotest50noroot154.	glbtest---vdomvdomglbtest	✓	✎
50VS67	101.28.15.251	cloud67	autotest50noroot67.	glbtest---vdomvdomglbtest	✓	✎
50VS247	102.214.42.12	cloud247	autotest50noroot247.	glbtest---vdomvdomglbtest	✓	✎
50VS98	104.141.240.245	cloud98	autotest50noroot98.	glbtest---vdomvdomglbtest	✓	✎

You can edit the Virtual Server and modify One Click GSLB-related parameters. To do so, disable One Click GSLB server. The virtual server will disappear from GSLB list afterwards.

Method 2

Go to **FortiADC > Server Load Balance > Virtual Server > edit Virtual Server > General**. You can modify the FQDN host/domain name or disable Virtual Server GSLB function here.

How to transform FortiADC GSLB to FortiAppSec Cloud GSLB

Object type	FortiADC location	FortiAppSec Cloud location
Data Center	Global Load Balance > Global Object > Data Center	GSLB > Virtual Server > Data Center
Server	Global Load Balance > Global Object > Server	GSLB > Virtual Server > Fabric Connectors
Location	Global Load Balance > FQDN Settings > Location List	GSLB > Service > Location
Virtual Server Pool	Global Load Balance > FQDN Settings > Virtual Server Pool	GSLB > Service > Virtual Server Pool
FQDN	Global Load Balance > FQDN Settings > Host	GSLB > Service > FQDN
Zone	Global Load Balance > Zone Tools > Zone	GSLB > DNS
Health Check	Shared Resources > Health Check > Health Check	GSLB > Health Check

Add FQDN with FortiADC

Perform the following steps to add an FQDN with FortiADC.

1. Create FQDN in GSLB services.
2. Create FQDN member and create new Virtual Server Pool. Then choose the virtual server from FortiADC into Pool. The virtual server from FortiADC will now work in GSLB services.
3. FortiADC virtual servers are synced with the Cloud, so please make sure to select the correct virtual server when adding it to the Pool

FortiGate Integration

This section covers all the use cases for using FortiAppSec Cloud with FortiGate.

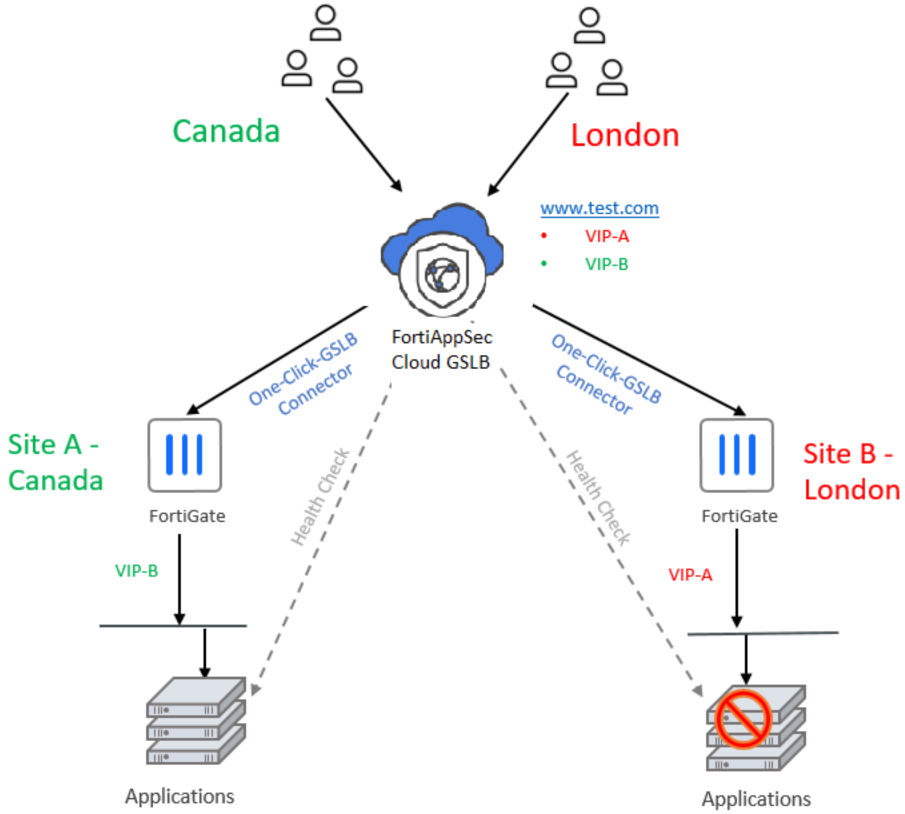
- FortiWeb Integration with One-Click GSLB on page 317
- Load balance FortiGate VPN servers to GSLB on page 313
- How to add FortiGate SD-WAN Inbound Load Balancing to GSLB on page 315
- How to add multisite LB (FortiGate) to GSLB on page 316

FortiGate Integration with One-Click GSLB

GSLB seamlessly integrates with FortiGate through the use of One-Click GSLB, streamlining server connections for enhanced efficiency. This section covers the following:

- Packet Flow on page 311
- Configuration prerequisites on page 311
- Configuration steps on page 311
- How to check the status of the FQDN on FortiAppSec Cloud GSLB on page 312
- How to view/edit FortiGate connector via GSLB after integration on page 312
- How to load balance traffic based on geolocation on page 313

By enabling One-Click GSLB, FortiGate synchronizes the Fully Qualified Domain Name (FQDN) configuration with Virtual IP (VIP) or Zero Trust Network Access (ZTNA) server features. This is beneficial for FortiGate customers that would like to load-balance an application across multiple data centers, based on factors such as availability or geographical location. In such cases, you can publish this application using a single FQDN on FortiAppSec Cloud using one-click GSLB. The result is a single domain with multiple unique IP addresses corresponding to the different FortiGates.



Please note that this feature is currently only available through the command line (CLI) and does not support web GUI configuration.

Packet Flow

1. The client sends a DNS query to the GSLB (www.test.com)
2. GSLB will redirect the user (based on the application Health Check) to the most available application according to the Geolocation, load, proximity, and service availability.

Configuration prerequisites

- The account of FortiGate's license should have a valid GSLB QPS license as well as a valid HC license.
- To enable a connector, the account license for FortiGate must match that of GSLB.
- This feature is supported by FortiGate version 7.4.2.

Configuration steps

1. Enable GSLB connector from FortiGate.
   a. **CLI:**

```
config system global
   set GSLB-integration enable
end
```

2. Configure the ZTNA/VIP policy and add the FQDN (hostname + domain) to the policy.
   a. **CLI:**

      Example VIP configuration:

      Example ZTNA configuration:

3. The FortiGate syncs the ZTNA/VIP configuration (along with the FQDN) to the GSLB via the One-Click GSLB connector.
4. You can always edit the VIP/domain/hostname on the FortiGate, which will automatically change on the GSLB.
5. Go to **Profiles > Health Check** and click **Create New** to set up a health check for your newly added FQDN. For more information and full descriptions of each field, see Health check on page 300.

How to check the status of the FQDN on FortiAppSec Cloud GSLB

1. Login to FortiAppSec Cloud and navigate to GSLB
2. Go to **Organization** via the left side navigation bar, and click on the organization in which you created your FQDN.
3. Once you are in your individual organization's portal, go to **GSLB Services** via the left side navigation bar.
4. Click on the name of the newly created FQDN. This opens a modal window (pictured below) that displays more details regarding the FQDN.

   Details for FQDN created from the VIP configuration under Configuration steps on page 311:

   Details for FQDN created from ZTNA configuration underConfiguration steps on page 311:

   Example of an FQDN with multiple Virtual Servers:

   If your FQDN does not appear in **GSLB Services** on the GSLB GUI, it could be due to the External IP (ExtIP) in the VIP/ZTNA being a private IP address. In other words, this refers to an IP reserved for use within private networks and is not routable on the public internet. In such instances, consider configuring the corresponding public IP address using `config gslb-public-ips` in the CLI.

5. Once your health check is set up, you can also see the status of your servers in **Profiles > Health Check**. For more information and full descriptions of each field, see Health check on page 300.

How to view/edit FortiGate connector via GSLB after integration

1. Navigate to **Fabric Connectors** and click on the relevant FortiGate involved in this process to check its status.

   On this page, you have the option to edit the FQDN/IPs on the FortiGate configuration by clicking on the edit icon on the right-hand side. To add a virtual server to a connector, click **Create Member**.

   To learn more about all the features available on this page, please refer to Fabric connector on page 284.

How to load balance traffic based on geolocation

1. Go to **Profiles > Data Center**
2. Click **Create New** to create the data center for the connector. The default data center for One-Click GSLB is set the United States, but you can set your region to any option in the drop-down lists under **Region.**
3. Navigate to Fabric Connectors and click the edit icon next to the desired connector.

   In **Edit Connector**, open the drop-down list under Data Center and select the data center you created in the previous step.

4. Go to GSLB services, select the desired FQDN and click the edit icon next to its virtual pool.

   In **Edit Pool**, change the **Preferred** method to **GEO**.

Load balance FortiGate VPN servers to GSLB

FortiAppSec Cloud enables clients to automatically connect to the most optimal FortiGate VPN server, ensuring efficient, high-speed access and reliable connectivity regardless of their location.

This section covers the following:

- Configuration Prerequisites on page 313
- Example Use case on page 313
- Configuration Steps on page 314

Configuration Prerequisites

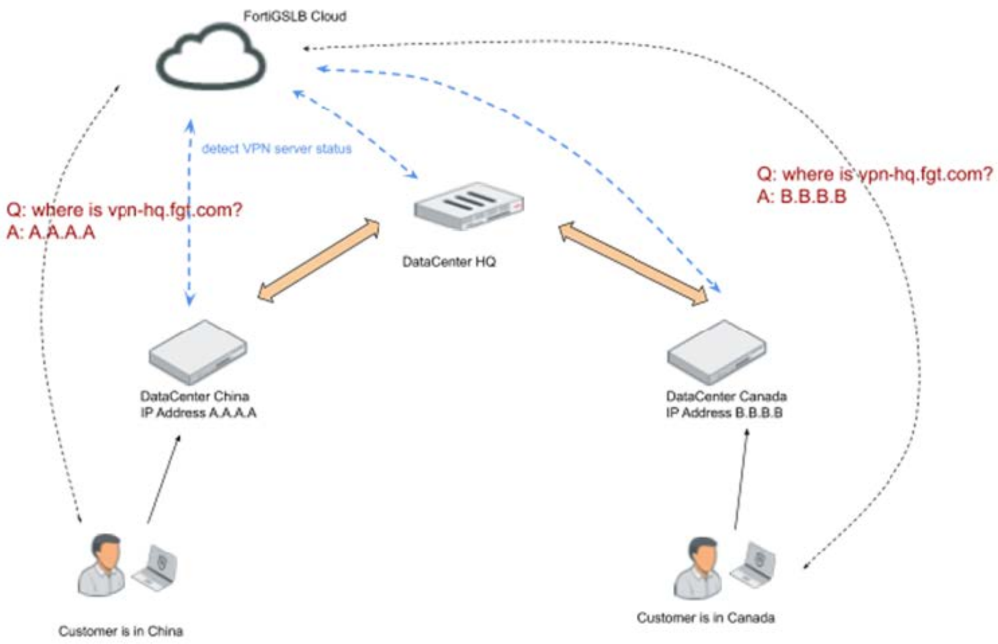
- A valid GSLB QPS license
- A valid HealthCheck license
- Allow the GSLB source IP addresses to access the FortiGate's restAPI. The source IP could be found at

Example Use case

In the following scenario, you have FortiGate VPN servers in two locations, each supporting a VPN service that connects to the company HQ.
GSLB manages these servers within a single pool, allowing for geographic load balancing of incoming traffic and real-time monitoring of the VPN servers’ status.

If traffic originates from one location, GSLB directs it to the nearest available server. If that server becomes unavailable, the traffic is automatically redirected to the next available VPN server.

This setup ensures that clients from any location can enjoy optimal VPN performance and a fast connection to the company HQ, even while traveling.



Example solution

The diagram below illustrates the solution for when all the client’s incoming traffic comes from one location.

Configuration Steps

1. Create a new FQDN for your FortiGate VPN in **GSLB Services**.
   a. For this example, the name of the FQDN will be 'VPN-hq.fgt.com'.
   b. For details on creating an FQDN, refer to Configuring GSLB Objects on page 255.

2. FQDN Member and Virtual Server Setup.
   a. Click *Create Member*. This option appears when you save the parent record from the previous step.

   b. Create a new virtual server. In this example, we will call it 'Pool1'.

      i. If you would like to load balance based on physical location, select GEO as the preferred method.

      ii. Click *Save*.
3. Create a pool member, a FortiGate connector, and a new connector member
   a. Create a pool member for 'Pool1' and create a new FortiGate Connector. We will refer to this connector as 'fgt-VPN1'.

   b. Create a new Data Center and create a new connector member. We can refer to this member as 'VPN1-DC1'.
   c. Add FortiGate 'VPN IP VPN1-DC1' Public IP and enable health check of your choice. In this case, we have enabled 'Default_HLTHCK_ICMP'.

4. Repeat step 3 for all additional Virtual Servers.

Note: The virtual server from the FortiGate Connector will be added into Pool and Connector directly and will work in GSLB services.

Sample topology view in GSLB

We have added each FortiGate VPN server into the GSLB pool. GSLB will load balance client traffic geographically using connector locations.

After completing these steps, the customer can monitor the VPN service status from both Location DC1 and Location DC2 on the GSLB Service detail page. The GSLB will load balance the traffic to the connector that have the nearest location. If the nearest location VPN server is down, the GSLB will direct the traffic to other available location. If both VPN service servers are not available, the GSLB will direct traffic to the default VPN server.

Note: The virtual servers from the FortiGate connector will be added into Pool and Connector directly and will work in GSLB Services.

How to add FortiGate SD-WAN Inbound Load Balancing to GSLB

Integrating FortiGate SD-WAN inbound load balancing with GSLB ensures high availability and optimized performance for an application by distributing traffic across multiple links and providing automatic failover to the default server when necessary.

This section covers the following:

- Example solution on page 315
- Configuration Steps on page 315

Example solution

This example illustrates the solution for when all the incoming traffic comes from one ISP.

The example assumes that the customer has three ISP routers. The FortiGate SD-WAN has three members for each ISP. The SD-WAN will do the out-going load balance for App1, but in some cases the incoming traffic will keep coming from ISP1 and ISP2, which causes the ISP1 and ISP2 links to be very busy and leaves ISP3 link very free.

To solve this issue, GSLB can load balance the incoming traffic to ISPs from the DNS level.

Configuration Steps

1. Create New Virtual Server in FortiGate (**Policy & Objects > Virtual Servers**) or use an existing Virtual Server.
2. Create FortiGate connector in **Fabric Connectors** and wait few seconds to sync virtual servers.
3. Bind SD-WAN link with virtual servers in FortiGate Connector.
4. Create FQDN for your SD-WAN application in GSLB services.
5. **Create FQDN member > Create new Virtual Server Pool**. Select Connector member *ISP1/ISP2/ISP3*, enable health check Default_HLTHCK_HTTP, and choose SDWAN-InBandwidth as the preferred method.
6. The virtual server from the FortiGate Connector will be added into the Pool and will work in GSLB services.

Sample topology view in FortiAppSec Cloud GSLB

After completing these steps, the customer will be able to monitor the App1 status for all ISPs on the GSLB service detail page. The GSLB will load balance the traffic to three links. If one of the links is down, the GSLB will direct the traffic to the available link. If all of the links are down, the GSLB will direct the traffic to the App1 default server.

How to add multisite LB (FortiGate) to GSLB

This use case describes multisite LB in cases of connector failure/busy. For customers who hold multiple datacenters with FortiGate and want to make sure the service is always on, GSLB can check FortiGate service availability and redirect users to the nearest available site.

Perform the following steps to add multisite LB (FortiGate) to GSLB:

1. Create New Virtual Server in FortiGate (**Policy & Objects > Virtual Servers**) or use the existing Virtual Servers.
2. Create two FortiGate connectors in **Fabric Connectors > Create Connector > Create data center**. Enable Virtual Server in Sync Control and enter FortiGate information. Wait a few seconds for the Virtual Servers to sync.
3. Navigate to **GSLB Services > Create FQDN**. Create an FQDN member and Create a new Virtual server Pool. Select GEO as the preferred method.
4. **Create pool member** and select Virtual Servers that synced from the two FortiGates.
5. The virtual servers from the multisite FortiGate connectors will be added into Pool and work in GSLB Services.

Example solution

This example illustrates the solution for the situation when all the incoming traffic comes from one data center.

This example assumes the following:

- You have two FortiGate connectors from different data centers.
- Every FortiGate has one member that supports App2 service.

Sometimes, the incoming traffic that comes from data center1, or from places close to data center1, will go to the connector (FortiGate) located in data center2, which is far away from the client, thus possibly causing long time latency and resource waste.

The GSLB can load balance the incoming traffic to the nearest available site according to the incoming traffic location and redirect to another site if that one is not available.

Also, GSLB will load balance the traffic by weight if no FortiGate service site matches the location.

Perform the following steps:

1. Create New Virtual Server in FortiGate (**Policy & Objects > Virtual Servers**) or use the existing Virtual Server.
2. Create FQDN App2-www.fgtdc.com in GSLB Services.
3. Create two FortiGate connectors with different Data Centers.
   a. Create a new FortiGate connector 'fgt-server1' and Create a new Data Center 'DC1'.
   b. Enter FortiGate1's IP/Auth and enable Sync Control for the virtual server.
   c. Wait a few seconds before refreshing to check that the virtual server has synced.
4. **Create FQDN member > Create new Virtual Server Pool** and use GEO preferred method
5. **Create pool member** and select FortiGate fgt-server1 Virtual Server APP2 DC1 Public IP 202.0.20.22 and enable health check Default_HLTHCK_HTTP.

6. **Create pool member** and select FortiGate fgt-server2 Virtual Server APP2 DC2 Public IP 54.20.0.23 and enable health check Default_HLTHCK_HTTP).

Sample topology view at GSLB

We have added two pool members to do the load balancing and each member belongs to one data center.

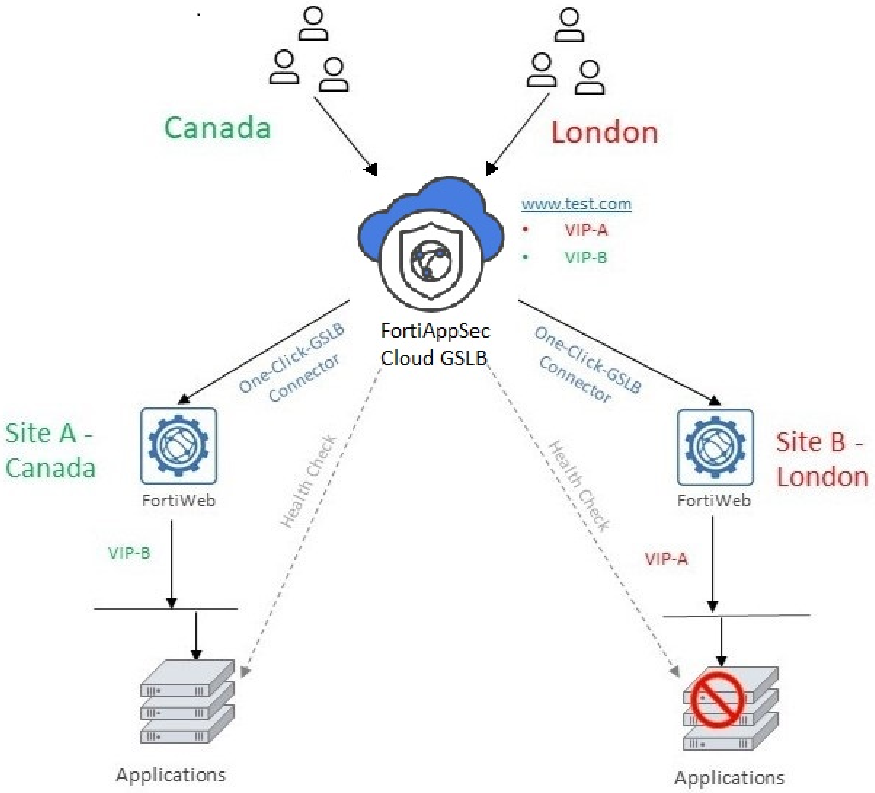
After completing these steps, the customer can monitor the App2 service status from both DC1 and DC2 on the FQDN service detail page. The GSLB will load balance the traffic to the service site that have the nearest data center. If the nearest data center is down, the GSLB will direct the traffic to other available data center. If both service sites are not available, the GSLB will direct the App2 default server.

FortiWeb Integration with One-Click GSLB

GSLB can integrate with FortiWeb through the use of One-Click GSLB. This section covers the following:

- Packet Flow on page 318
- Configuration prerequisites on page 318
- Configuration steps on page 318
- How to check the status of the FQDN on FortiAppSec Cloud on page 320

By enabling One-Click GSLB, FortiWeb users can load-balance applications across multiple data centers according to server load/state, Geo-IP and latency. In such cases, you can publish this application using a single FQDN on GSLB using one-click GSLB. The result is a single domain with multiple unique IP addresses corresponding the different data centers.



Packet Flow

1. The client sends a DNS query to the GSLB (www.test.com)
2. GSLB will redirect the user (based on the application Health Check) to the most available application according to the Geolocation, load, proximity, and service availability.

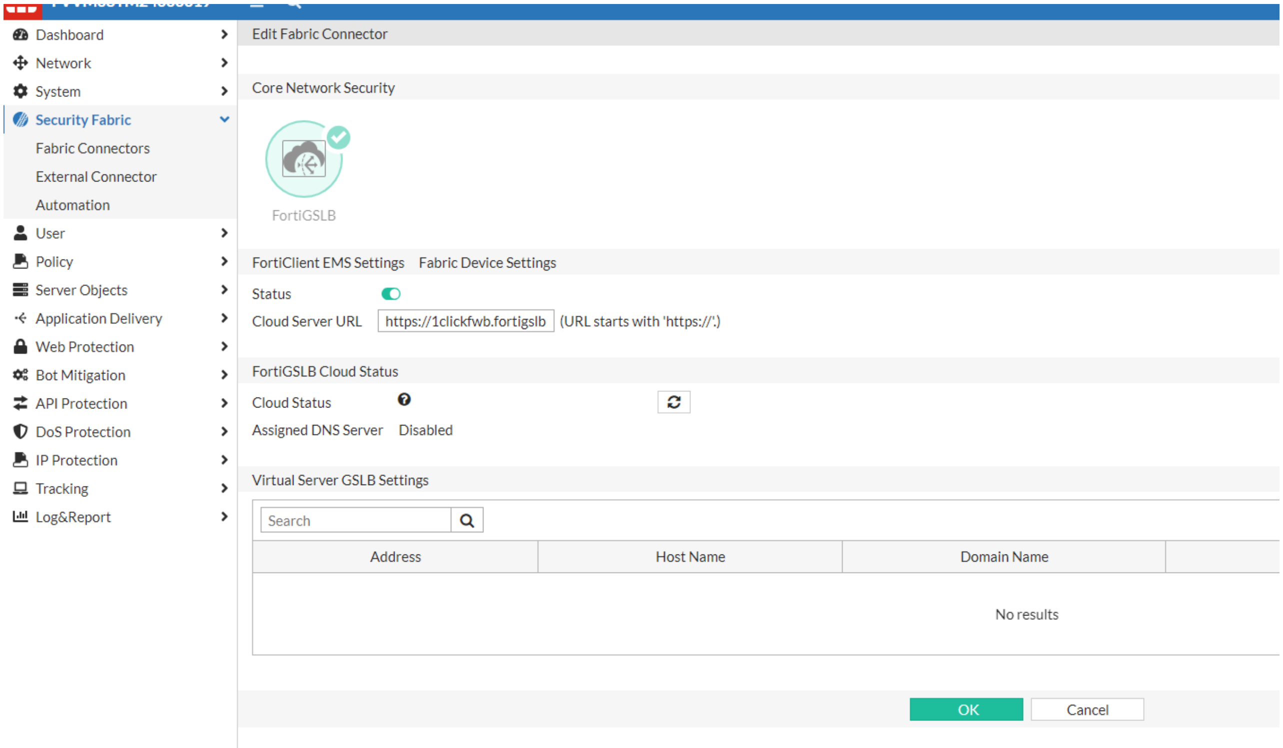
Configuration prerequisites

- The account of FortiWeb’s license should have a valid GSLB QPS license as well as a valid HealthCheck license.
- To enable a connector, the account license of FortiWeb must match that of FortiAppSec Cloud
- This feature is supported by FortiWeb version 7.4.2.

Configuration steps

1. Enable the GSLB connector on FortiWeb.

   Go to *Security Fabric* > *Fabric Connectors* > *GSLB*, enable *Status* and set *Server URL* as “https://1clickfwb.fortigslb.com”. Click *OK*.



Edit Fabric Connector

Core Network Security

FortiClient EMS Settings Fabric Device Settings

Status

Cloud Server URL https://1clickfwb.fortigslb (URL starts with 'https://'.)

FortiGSLB Cloud Status

Cloud Status

Assigned DNS Server Disabled

Virtual Server GSLB Settings

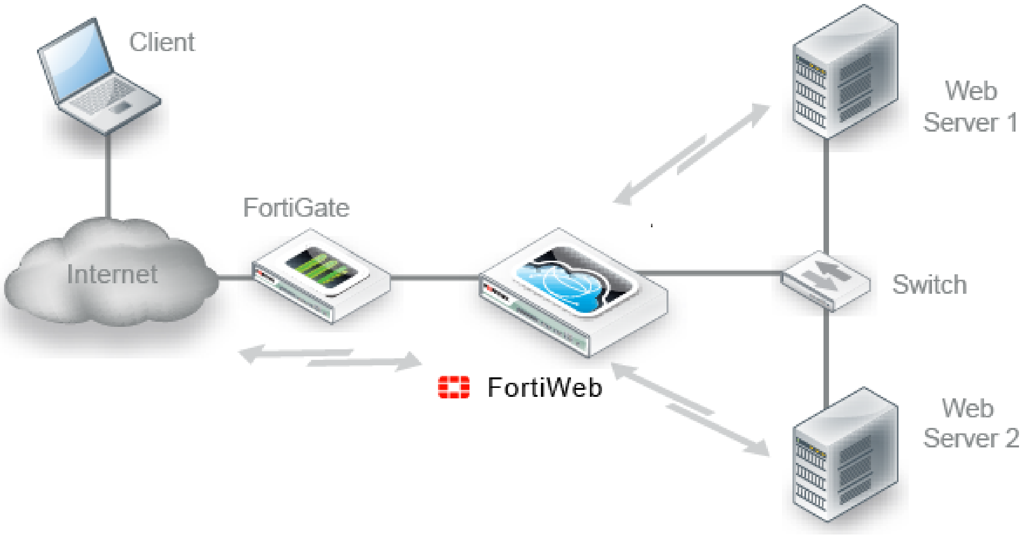
Search

Address	Host Name	Domain Name
	No results	

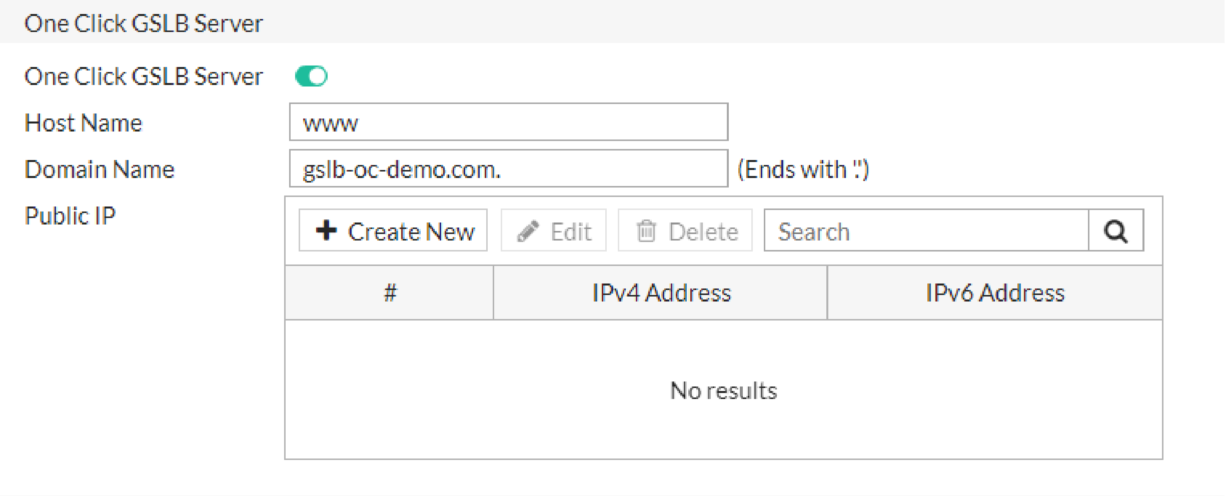
If no issues arise, the *Cloud Status* under *GSLB Status* should display as green. The *Assigned DNS Server* should be the primary anycast IP address assigned by GSLB.

2. Create a server policy on FortiWeb

   Go to *Policy* > *Server Policy*, click *Create New* to set up the server policy. In the *New Policy* page, enable *One Click GSLB Server*.
3. Enter the *Host Name* of this FortiWeb appliance.
4. Enter the *Domain Name* of your application (for example, "test.com").
5. Depending on FortiWeb's role in your network, the **Public IP** address can be either one of the following:
   - If FortiWeb is deployed within a private network, and has a gateway (such as FortiGate) positioned in front of it (as illustrated below), you should enter the gateway's public IP in this setting. In scenarios involving multiple gateways connected to multiple FortiWeb appliances, you should activate the **One Click GSLB Server** feature in each FortiWeb appliance. Subsequently, specify the public IP address of the particular gateway in the corresponding FortiWeb's **One Click GSLB Server** settings.



- If FortiWeb is directly connected to the Internet without a FortiGate, enter FortiWeb's public IP address in this setting. Note that in this scenario, the Public IP table can be left empty as the public IP address associated with the virtual server will be automatically pushed to GSLB.



One Click GSLB Server

One Click GSLB Server ●

Host Name: www

Domain Name: gslb-oc-demo.com. (Ends with '.')

Public IP

#	IPv4 Address	IPv6 Address
No results		

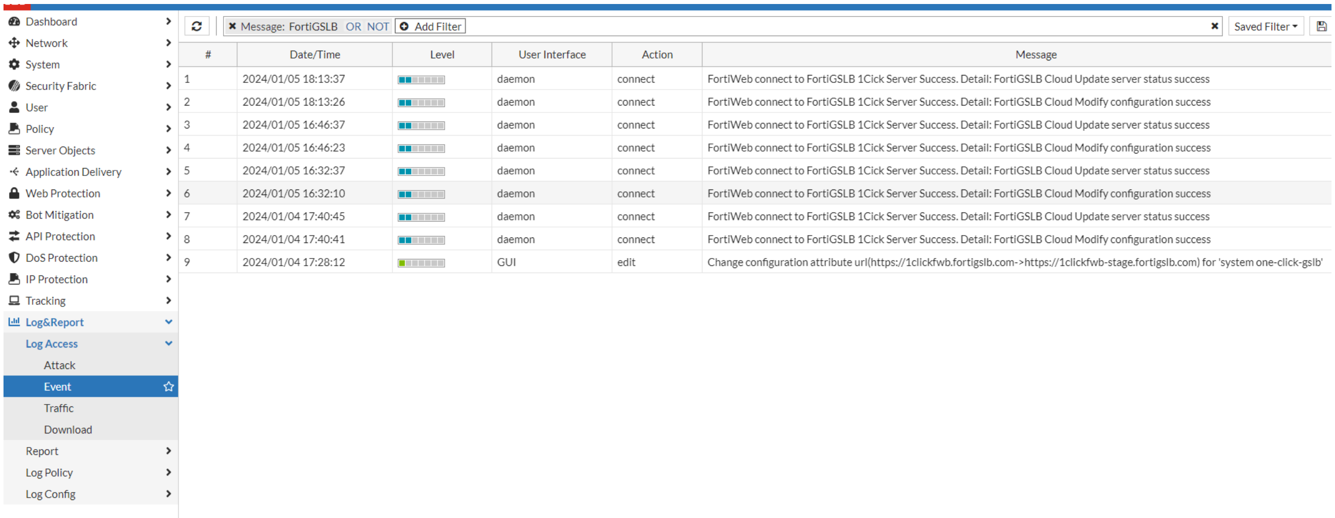
6. Click *OK* at the bottom of the page. FortiWeb will periodically synchronize the One-Click GSLB Server settings with GSLB to ensure that GSLB always reflects the latest settings.

How to check the status of the FQDN on FortiAppSec Cloud

1. Login to the FortiAppSec Cloud and navigate to **GSLB > Service > FQDN**
2. Find the widget for the desired FQDN, as it should display its status, as well as the individual statuses of its virtual server pool and virtual server.

Troubleshooting

To troubleshoot connection errors between FortiWeb and GSLB, log in to your FortiWeb account and go to *Log&Report > Log Access > Event*. Click *Add Filter*, select *Message*, and set the keyword to 'GSLB'.



Message: FortiGSLB OR NOT

#	Date/Time	Level	User Interface	Action	Message
1	2024/01/05 18:13:37	■■□□□□□	daemon	connect	FortiWeb connect to FortiGSLB 1Cick Server Success. Detail: FortiGSLB Cloud Update server status success
2	2024/01/05 18:13:26	■■□□□□□	daemon	connect	FortiWeb connect to FortiGSLB 1Cick Server Success. Detail: FortiGSLB Cloud Modify configuration success
3	2024/01/05 16:46:37	■■□□□□□	daemon	connect	FortiWeb connect to FortiGSLB 1Cick Server Success. Detail: FortiGSLB Cloud Update server status success
4	2024/01/05 16:46:23	■■□□□□□	daemon	connect	FortiWeb connect to FortiGSLB 1Cick Server Success. Detail: FortiGSLB Cloud Modify configuration success
5	2024/01/05 16:32:37	■■□□□□□	daemon	connect	FortiWeb connect to FortiGSLB 1Cick Server Success. Detail: FortiGSLB Cloud Update server status success
6	2024/01/05 16:32:10	■■□□□□□	daemon	connect	FortiWeb connect to FortiGSLB 1Cick Server Success. Detail: FortiGSLB Cloud Modify configuration success
7	2024/01/04 17:40:45	■■□□□□□	daemon	connect	FortiWeb connect to FortiGSLB 1Cick Server Success. Detail: FortiGSLB Cloud Update server status success
8	2024/01/04 17:40:41	■■□□□□□	daemon	connect	FortiWeb connect to FortiGSLB 1Cick Server Success. Detail: FortiGSLB Cloud Modify configuration success
9	2024/01/04 17:28:12	■□□□□□□	GUI	edit	Change configuration attribute url(https://1clickfwb.fortigslb.com->https://1clickfwb-stage.fortigslb.com) for 'system one-click-gslb'

Fabric connectors with AWS and Azure

The AWS and Azure connectors for GSLB provide seamless integration with AWS EC2, and Azure virtual machine and load balancer environments; enabling comprehensive load balancing and visibility for your cloud-based servers. This solution leverages the full configuration from AWS and Azure, ensuring optimal distribution of traffic and enhanced performance for your applications.

This section covers the following:

- Example Use Case on page 321
- How to configure a fabric connector with AWS on page 322
- How to configure a fabric connector with Azure on page 323
- Virtual Server Status on page 324
- Running Instances with Dynamic IPs on page 325

Key Features of AWS and Azure connectors

1. Automated Discovery and Configuration: Automatically integrate AWS EC2 instances and Azure VMs into GSLB, simplifying configuration management.
2. Intelligent Load Balancing: Distribute traffic across cloud instances based on health and performance metrics for optimal routing.
3. Enhanced Visibility and Monitoring: Gain insights into server performance and traffic patterns through detailed analytics and reporting.
4. Scalability and Flexibility: Easily scale application infrastructure and manage resources across AWS and Azure from a single interface.

Example Use Case

Scenario

A multinational e-commerce enterprise requires continuous availability and optimal performance for its web applications across multiple regions. The enterprise uses AWS EC2 instances in North America and Azure virtual machines in Europe to host its application servers.

Solution

1. Integration
   - GSLB connects to the enterprise's AWS and Azure environments, automatically discovering all EC2 instances and VMs.
   - The configuration details, including instance types, IP addresses, and region information, are imported into GSLB.
2. Load Balancing
   - GSLB distributes incoming traffic based on server health and load, ensuring that no single server is overwhelmed.
   - Real-time health checks are performed to dynamically adjust traffic flow, directing users to the best-performing servers.
3. Visibility
   - Detailed dashboards provide insights into server performance, traffic distribution, and user access patterns.
   - Alerts and notifications are set up for any performance issues or downtime, enabling proactive management.
4. Scalability
   - Automatically integrate additional instances during peak times, optimizing costs during off-peak times.

Benefits of AWS and Azure connectors

- Improved Performance: Ensures users are directed to the best-performing servers, reducing latency and enhancing user experience.
- High Availability: Maintains application uptime by distributing traffic across multiple cloud instances and regions.
- Comprehensive Monitoring: Provides deep visibility into server health and performance for informed decision-making.

How to configure a fabric connector with AWS

If you already have an AWS user with the necessary permissions and an *Access key* and *Secret access key*, you can skip to the last step.

1. Log into your AWS account, then go to *IAM* > *Users* and create a new user.

   Assign the *AmazonEC2FullAccess* and *AmazonEKSClusterPolicy* permissions to the user.
2. Generate Access Keys:
   a. Select the newly created user and generate a new pair of *Access key* and *Secret access key* where needed.
   b. For *User Case*, choose *Third-party service*.
3. Log into FortiAppSec Cloud, go to *Fabric Connectors* and click *Create Connector.*

   Enter the following fields on this page:

Field	Description
Name	The name of the connector. **Note**: After you initially save the configuration, you can still edit the name later.
Type	Select the type of connector you are creating. In this case, choose AWS. For more details on the different options, refer to Fabric connector on page 284.
AWS Access Key	Paste the *Access Key* from AWS.
AWS Access Secret	Paste the *Secret Access Key* from AWS.
Region	Eligible resources in the selected region will be synced to GSLB. For guidance on factors to consider when choosing a region, refer to the AWS documentation.

Click *Save*. The following should now be synchronized to FortiAppSec Cloud:

- EC2 instances that are running, regardless of whether their IP addresses are dynamically assigned.
- EC2 instances that are shut down but have an elastic IP assigned.

Please note that AWS Load Balancers are not included as virtual servers as CNAMEs are not currently supported.

Keep in mind the following for IPv6 Addresses:

- EC2 instances or VMs with only IPv6 addresses will be synced, whether they are running or shut down.
- EC2 instances or VMs with multiple IPv6 addresses will have each address treated as a separate virtual server in GSLB.

How to configure a fabric connector with Azure

If you already have an Azure user with the necessary permissions and a *Tenant ID, Client ID, Client Secret,* and *Subscription ID*, you can skip to the last step.

1. Create a New Application:
   a. Log into your Azure account and go to *App Registration* > *New registration* to create a new application.
   b. In the new application, create *Client credentials.*
   c. The tenant ID can be found on the application overview page.
2. Assign Role to the Application:
   a. Go to *Subscriptions* > *Access control (IAM)* > *Add role assignment*.
   b. Search and select *Virtual Machine Contributor* > *Next.*
   c. Select members, then search and select the new application created in step 1.
   d. Review and assign. The subscription ID can be found on the *Subscriptions* overview page.
3. Enter required information to FortiAppSec Cloud:

Field	Description
Name	The name of the connector. **Note**: After you initially save the configuration, you can still edit the name later.

Field	Description
Type	Select the type of connector you are creating. In this case, choose Azure. For more details on the different options, refer to Fabric connector on page 284.
Tenant ID	Copy and paste the Tenant ID from Azure.
Client ID	Copy and paste the Client ID from Azure.
Client Secret	Copy and paste the Client Secret from Azure.
Subscription ID	Copy and paste the Subscription ID from Azure.
Resource Group	The resource group of your virtual server(s). For more information on resource groups and how to manage them, please refer to Azure documentation.
Location	Select the region of your virtual server(s) from the drop-down list. For more information on Azure regions, please refer to Azure documentation.

a. Click **Save**. The following should be synchronized to FortiAppSec Cloud:
- Virtual Machines that are running, regardless of whether their IP addresses are dynamically assigned.
- Virtual Machines that are shut down but have a static IP assigned.
- Load Balancers.

Please note the following for Load Balancers:

- A running VM added to a load balancer will be removed from the “Virtual Machines” list.
- Load balancers will be synced even without any virtual machines.
- If a VM is part of a Load Balancer, both its IPv4 and IPv6 addresses will not appear under “Virtual Machines.” If this VM is added to a pool, its virtual server status will be shown as down in “Virtual Machines.”

Virtual Server Status

When your AWS or Azure credentials have successfully connected to GSLB, you will be able to see the EC2 instances, Virtual Machines, and Load Balancers from your AWS or Azure account.

To view your virtual servers, navigate to the edit connector page by going to *Fabric Connectors* and clicking on the edit icon corresponding to the connector you want to view.

The colored dots to the right of each virtual server indicate its status, as follows:

- Green: The virtual server is “AVAILABLE.”
- Red: The virtual server is “UNAVAILABLE,” which occurs when the EC2 or VM is down or when the key and credentials are deactivated.
- Grey: The virtual server is "UNKNOWN".

  This occurs when an EC2 instance with both IPv4 and IPv6 addresses changes only one IPv4 address after rebooting. If the virtual server is part of a pool, it must be manually deleted and re-added.

  If an EC2 or VM has a single IPv4 address, it updates automatically after changes.

A stopped VM with a detached static IPv4 address will show as grey.

Updating credentials without access permission will also result in a grey status.

Running Instances with Dynamic IPs

Please note the following for running instances with Dynamic IPs:

- If not added to a virtual server pool, the virtual server will be deleted if it is shut down.
- If added to a virtual server pool, the virtual server will **not** be deleted if it is shut down.

Threat Analytics

Threat Analytics uses machine learning algorithms to identify attack patterns across your entire application assets and aggregate them into security incidents and assign severity. It helps separate real threats from informational alerts and false positives and help you focus on the threats that matter.

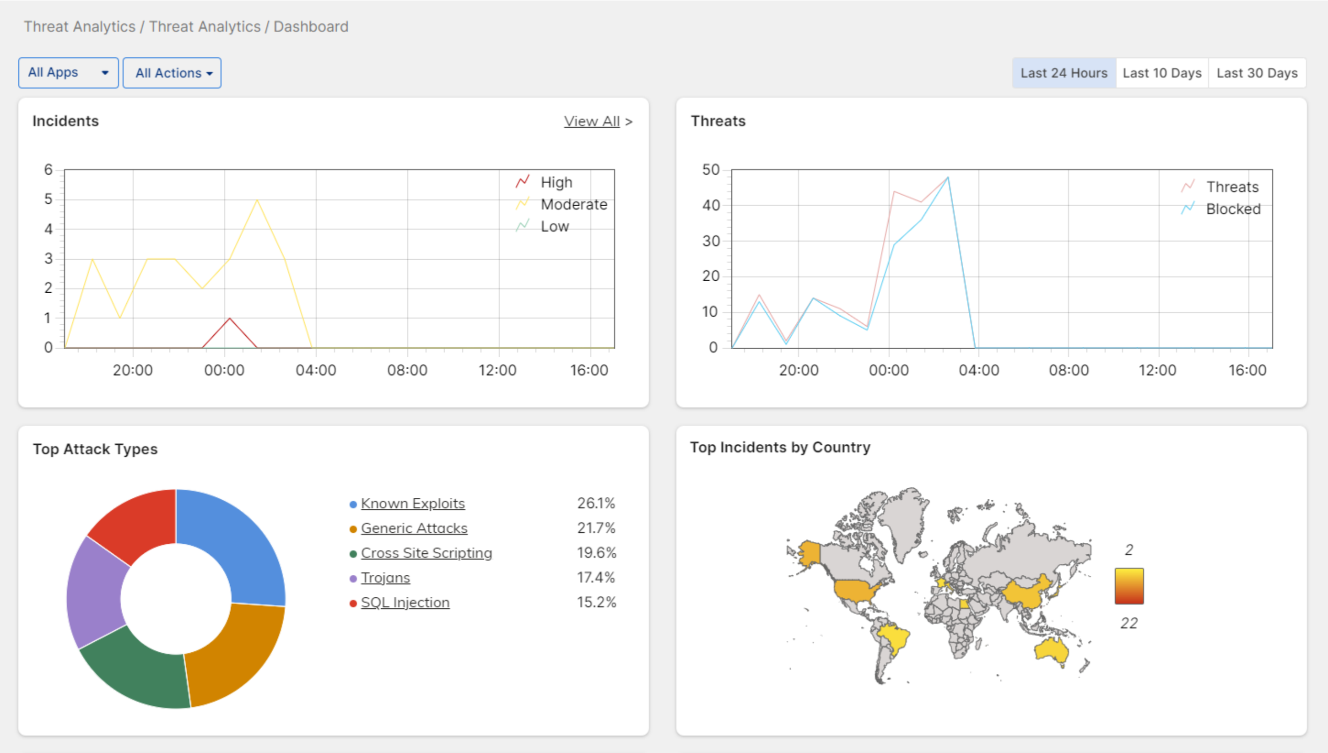
- Threat Analytics Dashboard on page 326
- Incidents
- Insights
- Settings
- Attack logs on page 335
- Gateways on page 346
- Security Operations Center-as-a-Service (SOCaaS) on page 346

Threat Analytics Dashboard

The default **Threat Analytics Dashboard** page opens when you click on **Threat Analytics** in the side navigation bar.

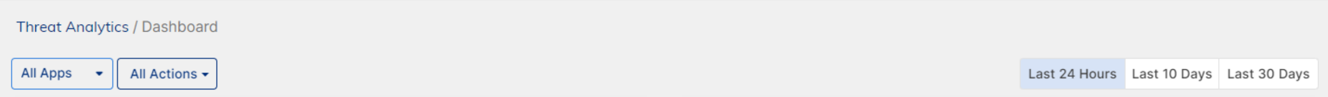
This section covers the following:

- Filter on page 327
- Widgets on page 327



Filter

You can narrow down the scope of these visualizations by specifying the desired application(s), attack types, and time frame of the attacks shown.



To filter by application, click on **All Apps** to expand the list of all applications on your account.

To filter by action, such as **Monitor** or **Block**, click on **All Actions** to expand list of options.

- When you select **Monitor**, the widgets on this page only reflect attacks that have been logged, but not interrupted.
- When you select **Block**, the widgets on this page only reflect attacks that have been stopped from reaching your application.

To filter by time frame, select one of the three options on the right side of the page:

- Last 24 hours
- Last 10 days
- Last 30 days

Widgets

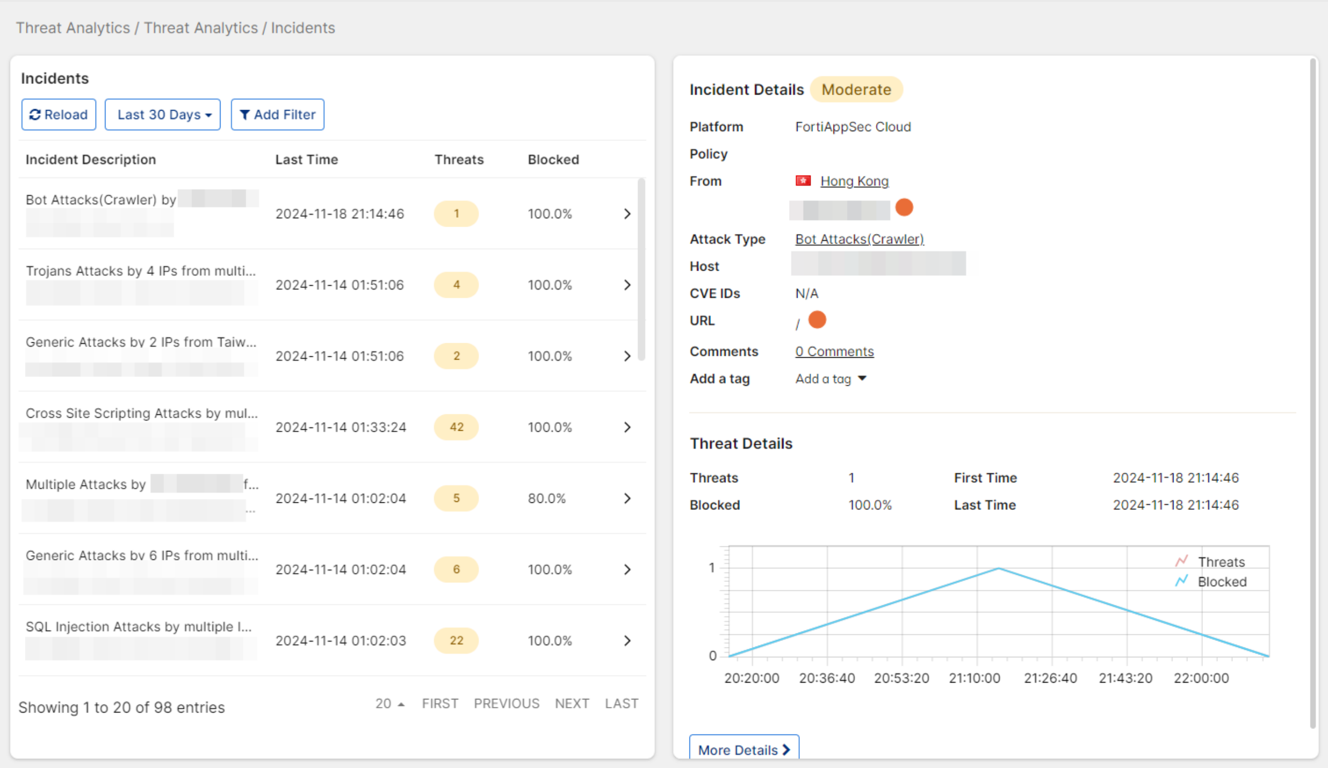
The **Threat Analytics Dashboard** displays widgets that provide insights to the attack traffic detected on your applications.

The following table highlights the information contained in each of the widgets:

Widget	Description
Incidents	Three lines that depict the number of notable incidents over the selected time frame. Each line represents a different level of severity. Hover over a line to see the number of incidents of the selected severity at the selected time.
Threats	Two lines that depict the number of threats, and the number of blocked interactions over the selected time frame. Hover over a line to see the number of threats or blocked interactions at the selected time.
Top Attack Types	Displays the pie chart distribution and percentage of most common attack types on your application.
Top Incidents by Country	A map displaying the geographical locations with the highest incidence of incidents.
Top Attacked Resources	A ranked table of applications on your platform with the highest number of threats, showing their platform and the Block/Monitor ratio for each.
Top Incidents by Severity	Displays the highest-severity activity on your applications.
Top Attacks by CVE ID	Displays the distribution and percentage of most common attacks by CVE ID. A CVE (Common Vulnerabilities and Exposures) is a publicly disclosed cybersecurity vulnerability or exposure that has been assigned a unique identifier, allowing it to be tracked and managed across different platforms and security systems.

Incidents

Attack events are aggregated into incidents based on common characteristics, allowing you to quickly identify frequent attack types, the most malicious source IP addresses, and more.



Threat Analytics / Threat Analytics / Incidents

Incidents

Incident Description	Last Time	Threats	Blocked	
Bot Attacks(Crawler) by [redacted]	2024-11-18 21:14:46	1	100.0%	>
Trojans Attacks by 4 IPs from multi... [redacted]	2024-11-14 01:51:06	4	100.0%	>
Generic Attacks by 2 IPs from Taiw... [redacted]	2024-11-14 01:51:06	2	100.0%	>
Cross Site Scripting Attacks by mul... [redacted]	2024-11-14 01:33:24	42	100.0%	>
Multiple Attacks by [redacted] f... [redacted] ...	2024-11-14 01:02:04	5	80.0%	>
Generic Attacks by 6 IPs from multi... [redacted]	2024-11-14 01:02:04	6	100.0%	>
SQL Injection Attacks by multiple I... [redacted]	2024-11-14 01:02:03	22	100.0%	>

Showing 1 to 20 of 98 entries

Incident Details Moderate

Platform	FortiAppSec Cloud
Policy	
From	Hong Kong [redacted] ●
Attack Type	Bot Attacks(Crawler)
Host	[redacted]
CVE IDs	N/A
URL	/ ●
Comments	0 Comments
Add a tag	Add a tag

Threat Details

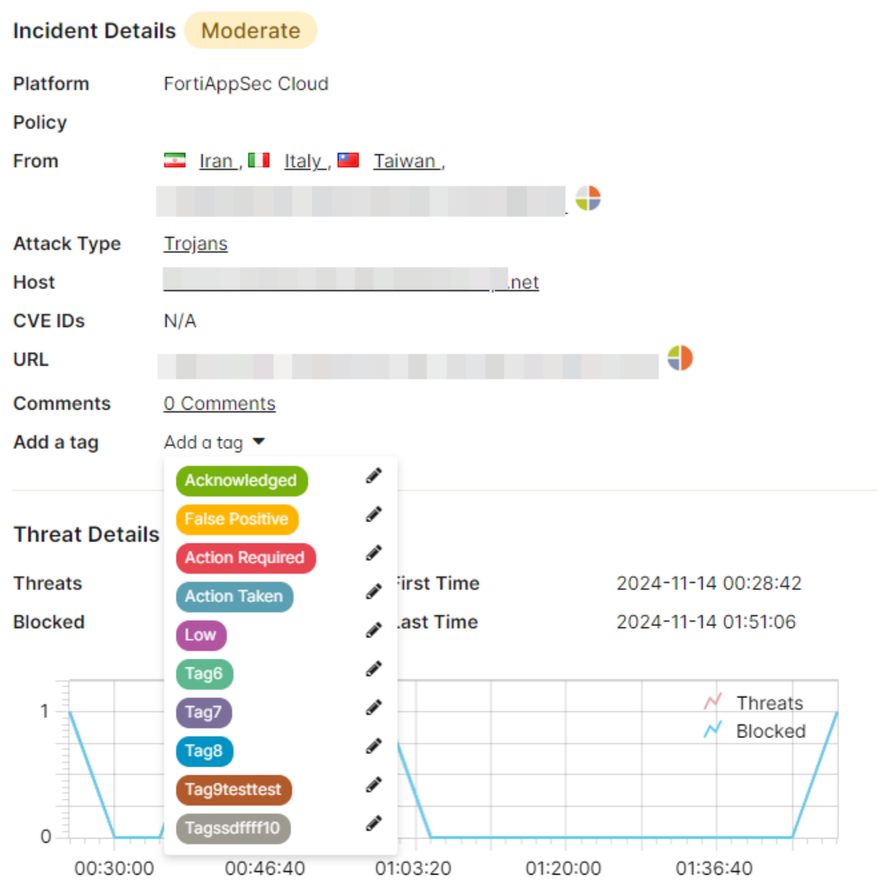
Threats	1	First Time	2024-11-18 21:14:46
Blocked	100.0%	Last Time	2024-11-18 21:14:46

Selecting an incident reveals details such as the attack type, target application, and source IPs.

You can filter the displayed Incidents by the Last detected time, App Name, Attack Type, CVE ID, Device, Host, Incident ID, Source Country, Source IP, and Tag.

Incident Organization

You can add tags with predefined labels to mark incidents, which updates their status icons for easier tracking. These labels are for your reference only and do not affect the system’s threat detection but help with organizing incidents for sorting, filtering, and acknowledgment. Tag names can also be edited to suit your needs.



Incident Details Moderate

Platform FortiAppSec Cloud

Policy

From Iran , Italy , Taiwan , [redacted]

Attack Type Trojans

Host [redacted].net

CVE IDs N/A

URL [redacted]

Comments 0 Comments

Add a tag Add a tag

Threat Details

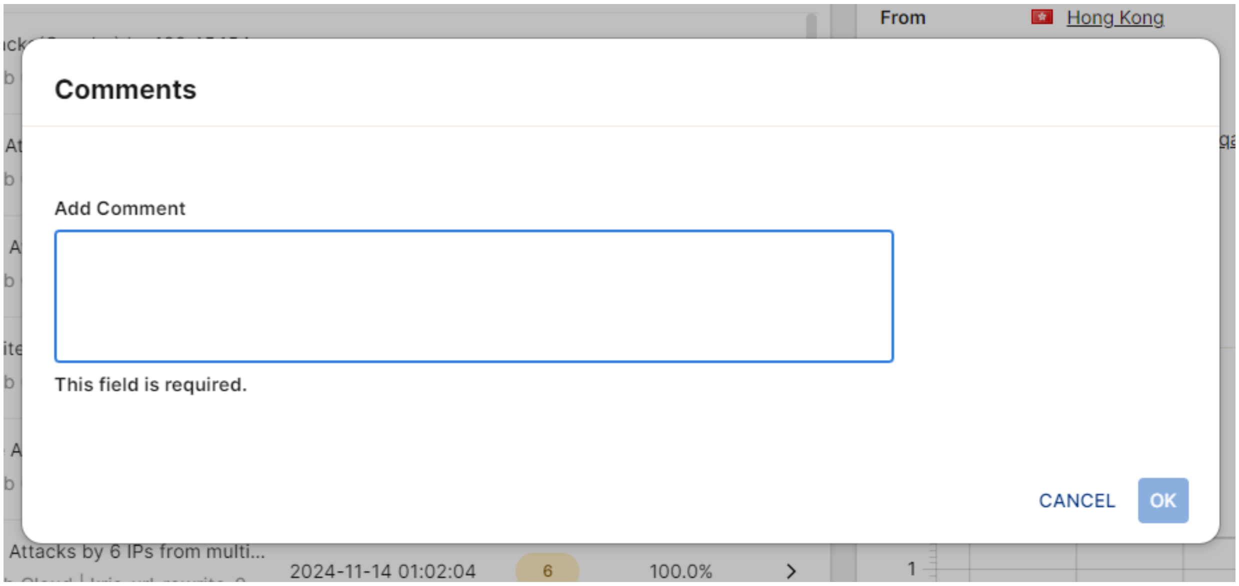
Threats

Blocked

irst Time 2024-11-14 00:28:42

.ast Time 2024-11-14 01:51:06

Additionally, you can use the **Comments** link under **Incident Details** to add notes to an incident.



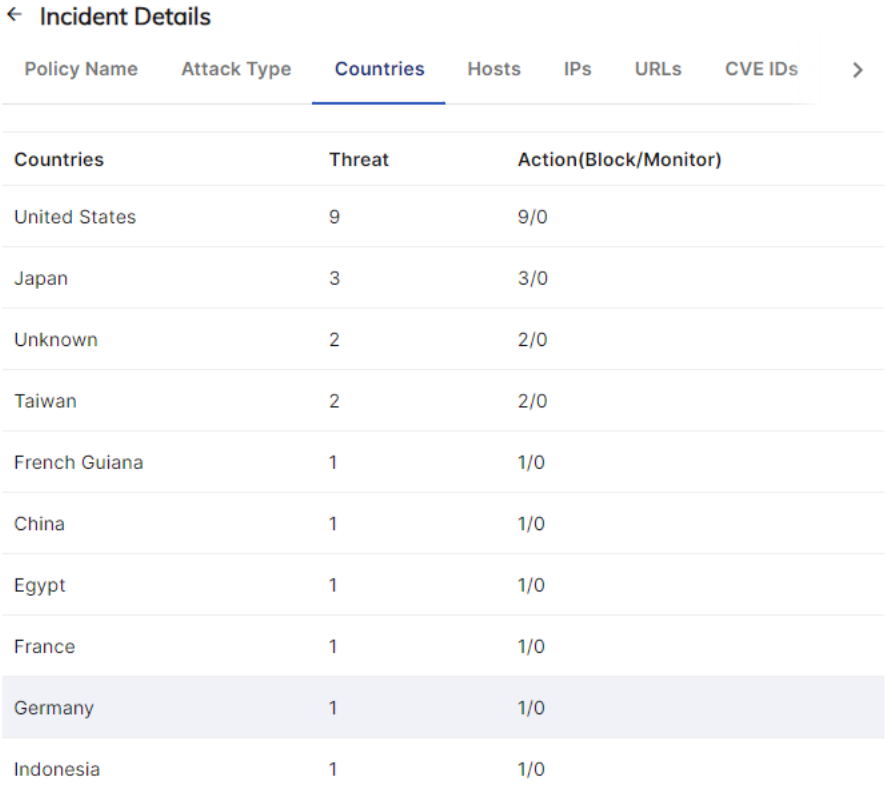
Comments

Add Comment

This field is required.

Additional Incident Details

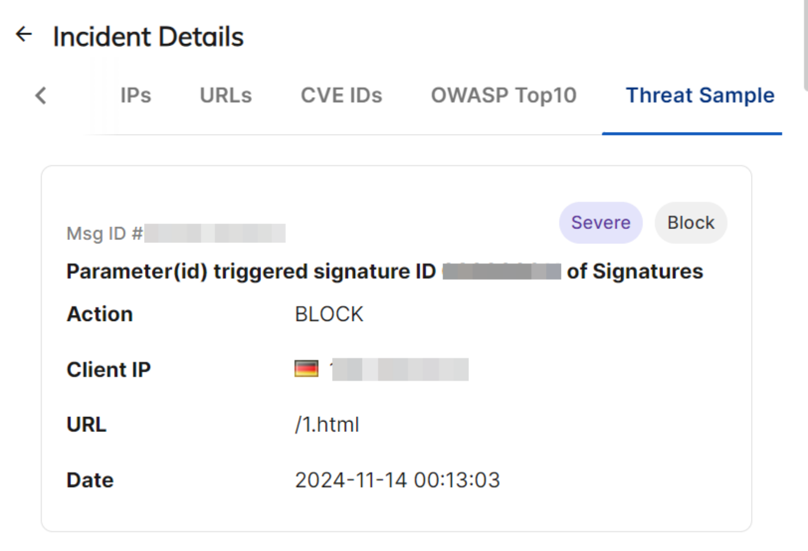
You can access additional information on the selected incident by scrolling down **Incident Details** clicking **More Details**.



Countries	Threat	Action(Block/Monitor)
United States	9	9/0
Japan	3	3/0
Unknown	2	2/0
Taiwan	2	2/0
French Guiana	1	1/0
China	1	1/0
Egypt	1	1/0
France	1	1/0
Germany	1	1/0
Indonesia	1	1/0

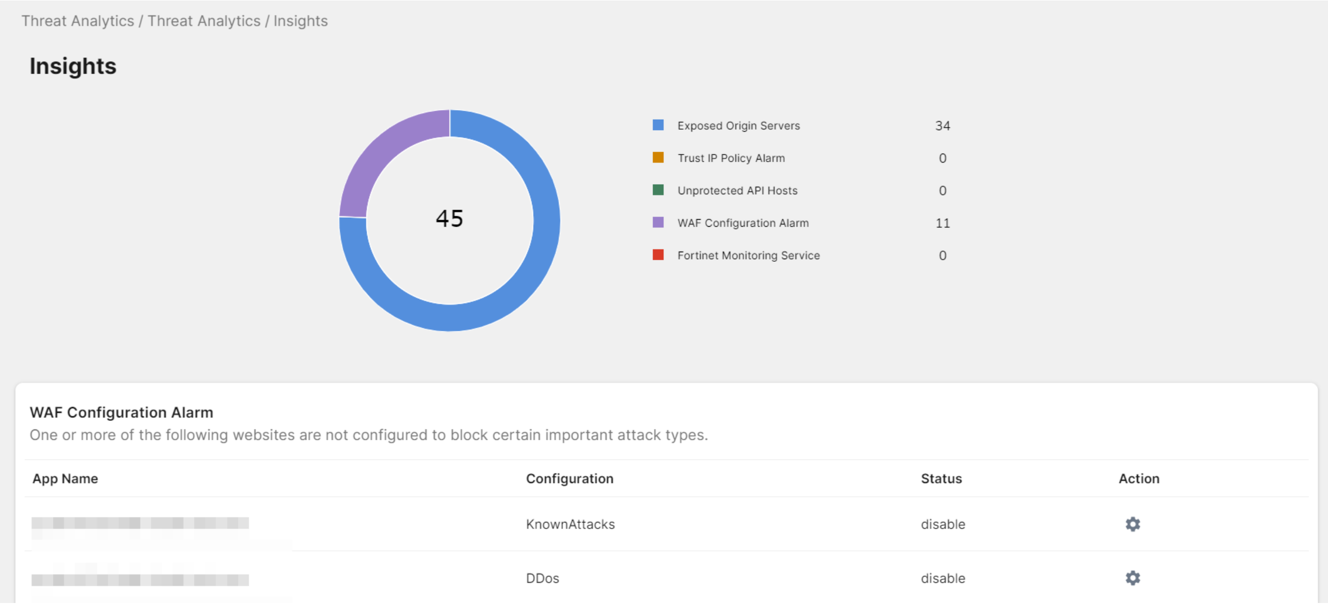
When you click on any detail category on this page (except for Threat Sample), a table is displayed showing the information described below, along with the corresponding threat count and block/monitor ratio. The block count indicates how many transactions were blocked, while the monitor count represents the total number of transactions detected for this incident.

Detail Category	Descripion
Policy Name	The name of the afflicted application.
Attack Type	The type of attack(s) detected by Threat Analytics. Examples include SQL Injections, Cross-Site Scripting, and Trojans Attacks.
Countries	The countrie(s) from which attacks in the recorded incident originate.
Hosts	The host(s) of the afflicted application.

Detail Category	Descripion
IPs	The Client IP address(es) from which the attack came from.
URLs	The URL(s) on your domain where the attacks occurred.
CVE IDs	The CVE ID(s) associated with the incident. CVE IDs are unique identifiers for tracking publicly disclosed cybersecurity vulnerabilities. They follow the format CVE-YYYY-NNNNN (e.g., CVE-2023-12345) and are managed by the CVE Program, overseen by MITRE. If no CVE ID is associated with this attack, this will display as N/A.
OWASP Top 10	The OWASP Top 10 risk(s) associated with the incident. The OWASP Top 10 is a list of the most critical security risks to web applications, published by the Open Web Application Security Project (OWASP).
Threat Sample	This page lists out each detected transaction within the incident and lists out its description, Action, Client IP address, URL, and date detected.  Incident Details IPs URLs CVE IDs OWASP Top10 Threat Sample Msg ID #[redacted] Severe Block Parameter(id) triggered signature ID [redacted] of Signatures Action BLOCK Client IP [redacted] URL /1.html Date 2024-11-14 00:13:03

Insights

The Insights page adds another level of incident analysis and provides recommendations to enhance your security posture.



Threat Analytics / Threat Analytics / Insights

Insights

🟦 Exposed Origin Servers	34
🟧 Trust IP Policy Alarm	0
🟩 Unprotected API Hosts	0
🟪 WAF Configuration Alarm	11
🟥 Fortinet Monitoring Service	0

WAF Configuration Alarm

One or more of the following websites are not configured to block certain important attack types.

App Name	Configuration	Status	Action
[redacted]	KnownAttacks	disable	⚙
[redacted]	DDos	disable	⚙

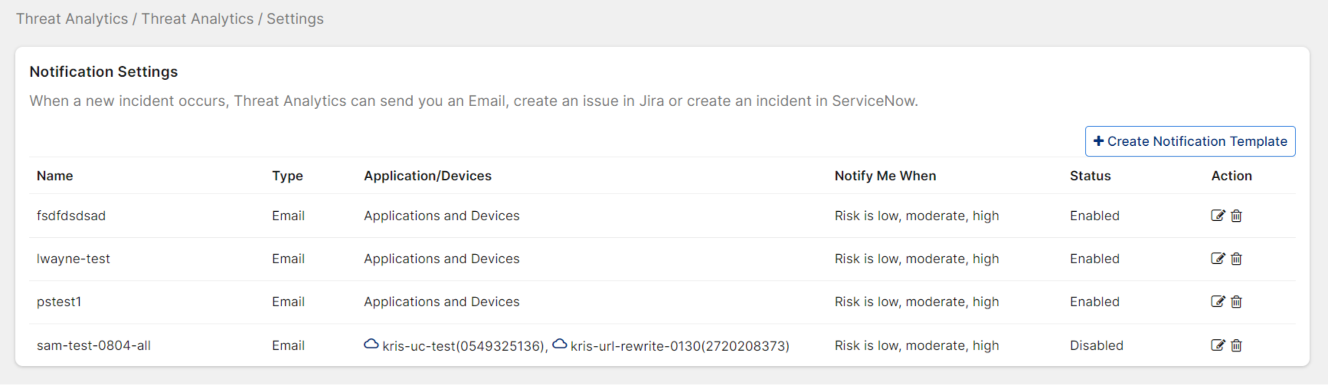
The pie chart on this page shows the highest security risk factors in your application, along with the number of violations detected for each risk factor across your applications.

Clicking on one of the listed threats next to the pie chart will modify the table below the chart to show information specific to the selected threat, along with information for suggested actions.

Threat	Description
Exposed Origin Servers	This refers to situations where parts of your application expose the address of the physical or virtual machine hosting the application and/or database software. Examples include when the Origin Server IP is directly accessible through HTTP/HTTPS requests or is visible in public DNS records.
Trust IP Policy Alarm	This threat occurs when your account's **Trust IP** list contains IPs with a bad reputation that have been identified as malicious. We recommend removing these IPs immediately from the **Trust IP** list in **Access Rules > IP Protection**.
Unprotected API Hosts	This threat occurs when one of the hosts in your account is not protected by API security. When this occurs, we recommend enabling **ML based API Protection** to automatically discover and protect all API endpoints.
WAF Configuration Alarm	This refers to when one or more websites on your account are not configured to block important attack types. To better protect your application, please find the suggested page under **Configuration** in the table below, and navigate to said page under **WAF**.
Fortinet Monitoring Service	This includes threats detected by engineers through Fortinet's managed services, such as SOCaaS.

Settings

You can now define various rules to automatically create a Jira or ServiceNow ticket, or send an email when certain Incidents occur. This can help SOC analysts assign an incident to someone else in the organization.



Threat Analytics / Threat Analytics / Settings

Notification Settings

When a new incident occurs, Threat Analytics can send you an Email, create an issue in Jira or create an incident in ServiceNow.

Name	Type	Application/Devices	Notify Me When	Status	Action
fsdfdsdsad	Email	Applications and Devices	Risk is low, moderate, high	Enabled	✎ 🗑
lwayne-test	Email	Applications and Devices	Risk is low, moderate, high	Enabled	✎ 🗑
pstest1	Email	Applications and Devices	Risk is low, moderate, high	Enabled	✎ 🗑
sam-test-0804-all	Email	☁ kris-uc-test(0549325136), ☁ kris-url-rewrite-0130(2720208373)	Risk is low, moderate, high	Disabled	✎ 🗑

To send email or create Jira tickets when certain incidents occur:

1. Go to **Threat Analytics > Settings**.
2. Click **Create Notification Template**.
3. Enter a name for the template.
4. For **Applications/Devices**, select:
   - **All Applications and Devices:** Notifications will be sent when incidents on any of the application or device occur.
   - **Customized:** Notifications will be sent only when incidents on the selected applications or devices occur.
5. Select the applications or devices you want to monitor, then move them to the **Selected** list. Please note that the applications in the list are those for which you have either read-write or read-only permission.
6. Turn on **Status** if you want this notification template to take effect.
7. Click **Next**.
8. Select **Notify me when** incident with certain risk level occurs.
   There may have multiple attack events with common characteristics aggregated in one incident. Incident with higher risk level means that there are more attack logs in it.
9. Select whether to send notification through email or Jira.
   - **Email**
     Configure the **Recipient**, **Subject**, **Template**. Separate multiple email addresses with ",".
     You can add macros as you want. Type "%%" then the available macro will pop up.
   - **Jira**
     i. Enter the Jira URL, then the **Account** and **Token** for FortiAppSec Cloud to build up a connection with Jira.
     ii. Click **Next**. FortiAppSec Cloud will verify the token and account. It will not proceed to next page if the verification fails.
     iii. FortiAppSec Cloud pulls the project names, issue types, and reporters from Jira, then populate them in the drop-down list. Select from the list. The Jira incident to be created will be tagged with the selected project name, issue type, and reporter.
     iv. Edit the **Summary** and **Description**. You can add macros as you want. Type "%%" then the available macro will be popped up.
     v. Click **Save**.

- **ServiceNow**
  1. Enter the ServiceNow URL, then the **Client ID** and **Client Secret** for FortiAppSec Cloud to build up connection with ServiceNow.
  2. Click **Next**. FortiAppSec Cloud will verify the token and account. It will not proceed to next page if the verification fails.
  3. FortiAppSec Cloud pulls the Caller, Assignment Group from ServiceNow, then populate them in the drop-down list. Select from the list. The ServiceNow incident to be created will be tagged with the selected Caller and Assignment Group.
  4. Edit the **Summary** and **Description**. You can add macros as you want. Type "%%" then the available macro will be popped up.
  5. Click **Save**.

The **Notification Settings** is globally applied, which means the **Notification Template** created or edited in your account will also be applied to other accounts under the same root account.

In certain cases you will see the application names shown as unknown. These are the applications to which you don't have Read-Only or Read-Write permission.

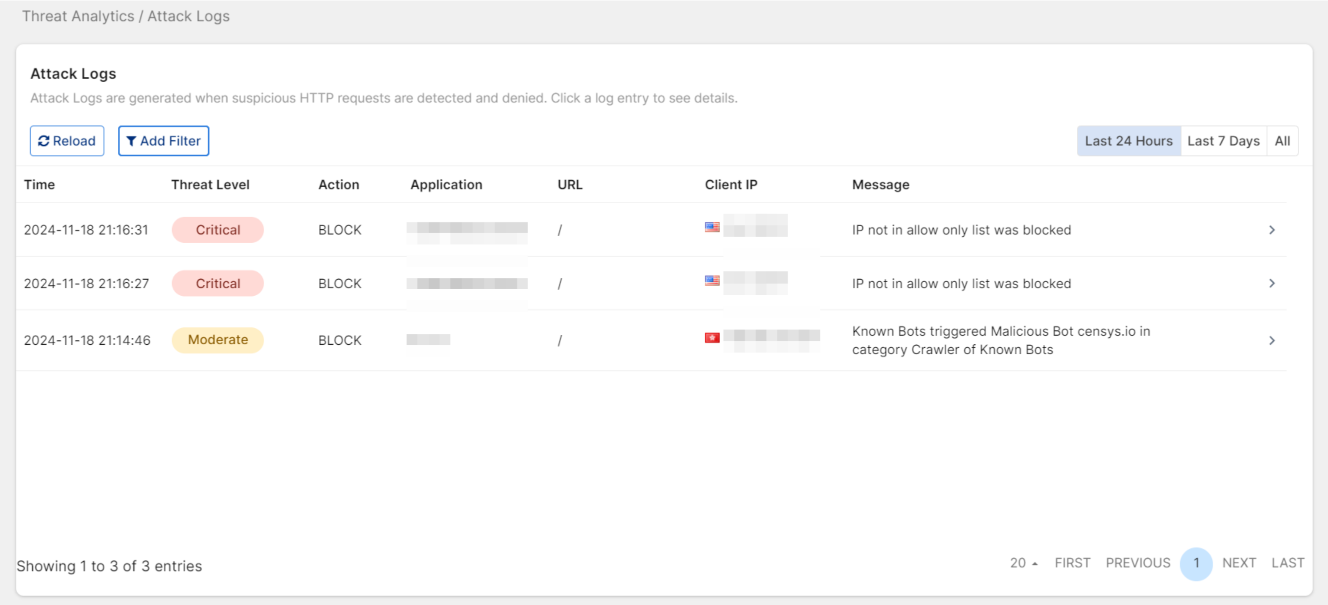
Attack logs

The Attack Logs now display logs from all applications. You can click on an entry to view detailed threat information or use the Add Filter option to filter threats as needed. Click Reload to refresh the page and load any new logs recorded since the last time it was accessed.

Unlike FortiView, which organizes threat data into different categories, the Threat Analytics **Attack Logs** page lists all threats in a single table.

A maximum of 10,000 logs will be displayed per filter, and FortiAppSec Cloud retains attack logs for two months before they are deleted.

If you know that a certain URL frequently triggers false violations by matching an attack signature during normal use, you can add an exception beside the signature ID. This will ensure traffic to the specified URL and/or parameter is not treated as an attack, even if it matches the signature. For Request URL and Parameter Name, at least one must be enabled. Please allow several minutes for the configuration to take effect.



Threat Analytics / Attack Logs

Attack Logs

Attack Logs are generated when suspicious HTTP requests are detected and denied. Click a log entry to see details.

Time	Threat Level	Action	Application	URL	Client IP	Message
2024-11-18 21:16:31	Critical	BLOCK	[redacted]	/	[redacted]	IP not in allow only list was blocked
2024-11-18 21:16:27	Critical	BLOCK	[redacted]	/	[redacted]	IP not in allow only list was blocked
2024-11-18 21:14:46	Moderate	BLOCK	[redacted]	/	[redacted]	Known Bots triggered Malicious Bot censys.io in category Crawler of Known Bots

Showing 1 to 3 of 3 entries

Request URL	Specify a URL value to match. For example, `/testpage.php`, which match requests for `http://www.test.com/testpage.php`. • If **String Match** is selected, ensure the value starts with a forward slash (/) (for example, `/testpage.php`). You can enter a precise URL, such as /floder1/index.htm or use wildcards to match multiple URLs, such as /floder1/* ,or /floder1/*/index.htm. • If **Regular Expression Match** is selected, the value does not require a forward slash (/). However, ensure that it can match values that contain a forward slash. For details, see Frequently used regular expressions on page 177. Do not include a domain name because it's by default the domain name of this application.
Parameter Name	Specify a parameter name to match. For example, `http://www.test.com/testpage.php?a=1`, the parameter name is "a". To create a regular expression, see Frequently used regular expressions on page 177.

Please note that the number of attacks displayed in Attack Logs, FortiView Threat View , and Blocked Requests widget on Dashboard are slightly different.

- Certain attack types such as Bot and DDoS attacks generate a large amount of requests in a short time. To prevent numerous identical attack logs flooding the UI, FortiAppSec Cloud only logs the first request in Attack Logs and FortiView Threat View , while it shows the actual count in Blocked Requests Widget so you can know how many actual attack requests were blocked.
- To prevent Information Leakage, FortiAppSec Cloud may cloak the error pages or erase sensitive HTTP headers in response packets. Such items are logged only once per minute in Attack Logs and FortiView Threat View for you to know the Information Leakage rule took effect. In the meanwhile, the actual count is recorded in Blocked Requests Widget.
- If you have set FortiAppSec Cloud to block attacks but not generate a log when certain violation occurs, such as Alert & Deny (no log), then the attacks will not be logged in Attack Logs and FortiView , but will be counted in the Blocked Requests widget.
  To identify the security feature blocking your request, map the Attack ID value to the corresponding description in

the table below.

Attack ID	Security Rule
20000001	Allow Method
20000002	Protected Hostnames
20000003	Page Access
20000004	Start Pages
20000005	Parameter Validation
20000006	Black IP List
20000007	URL Access
20000008	Signature Detection
20000009	Custom Signature Detection
20000011	Hidden Fields
20000012	Site Publish
20000013	HTTP Parsing Error
20000014	DoS Protection
20000015	SYN Flood Protection
20000016	HTTPS Connection Failure
20000017	File Upload Restriction
20000018	GEO IP
20000019	Illegal XML Format
20000020	Illegal JSON Format
20000021	Custom Access
20000022	IP Reputation
20000023	Padding Oracle
20000024	CSRF Protection
20000025	Quarantined IPs
20000026	HTTP Protocol Constraints
20000027	Credential Stuffing Defense
20000028	User Tracking
20000029	XML Validation Violation
20000030	Cookie Security
20000031	FTP Command Restriction

Attack ID	Security Rule
20000032	FTP Parsing Error
20000033	Timeout Session
20000034	Other Attacks
20000035	FTP File Security
20000036	FTPS Connection Failure
20000037	Anomaly Detection
20000038	OpenAPI Validation Violation
20000039	WebSocket Security
20000040	MITB AJAX Security
20000041	Bot Detection
20000042	CORS Check Security
20000043	JSON Validation Security
20000044	Mobile API Protection
20000045	Bot Deception
20000046	Biometrics Based Detection
20000047	Threshold Based Detection
20000048	API Gateway
20000049	URL Encryption
20000050	SQL/XSS Syntax Based Detection
20000051	Known Bots Detection
20000053	Allow Only IP List
20000200	Known Attacks
20000201	Information Leakage
20000202	Cookie Security
20000203	File Protection
20000204	Client Security
20000205	Request Limits
20000206	URL Access
20000207	IP Protection
20000208	Bot Mitigation
20000209	DDoS Prevention

Attack ID	Security Rule
20000210	XML Security
20000211	OpenAPI Validation
20000212	WebSocket Security
20000213	Known Bots Detection
20000214	API Gateway
20000215	Mobile API
20000216	JSON Security

Forwarding FortiADC attack logs to Threat Analytics

Through the FortiADC integration with FortiAppSec Cloud Threat Analytics, you can forward FortiADC attack logs to FortiAppSec Cloud where the AI-based Threat Analytics engine identifies unknown attack patterns by parsing through all FortiADC attack logs and then aggregating similar or related attack logs into single incidents. This allows you to use these identified attack patterns to protect your application against the identified threats.

Prerequisites for using Threat Analytics for FortiADC attack logs:

- You must have a valid Threat Analytics service license.
- You must have the Threat Analytics service enabled in FortiADC.

Please note that when your license expires or becomes invalid, the log forwarding will stop immediately regardless of whether the Threat Analytics service is enabled.

14-Day Evaluation license

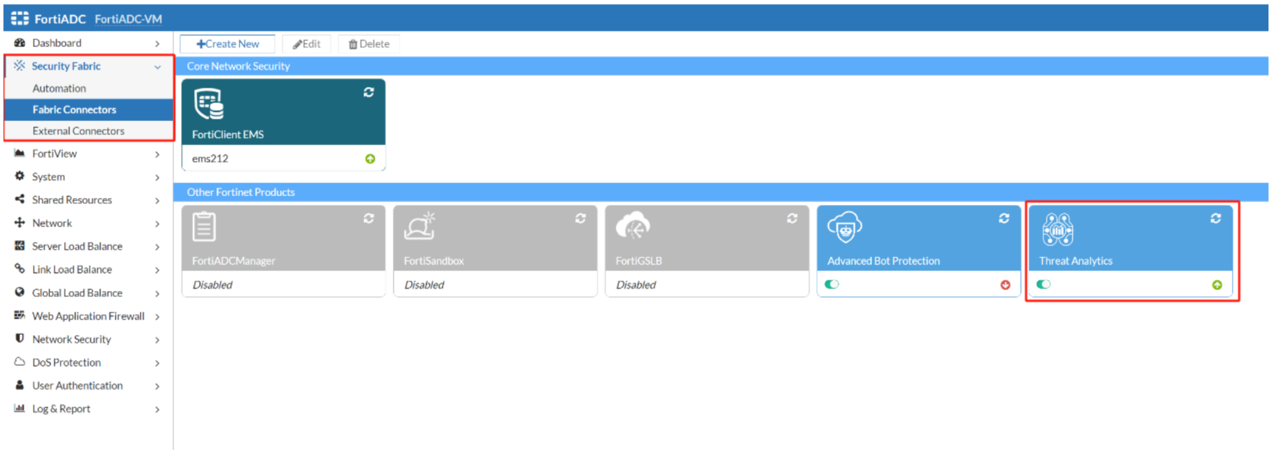
A 14-day Evaluation license is offered to customers who would want to evaluate the Threat Analytics service. This 14-day Evaluation license can only be used once. To activate the 14-day Evaluation license, enable Threat Analytics connector from **Security Fabric > Fabric Connectors**. During this 14-day trial period, you can disable and re-enable Threat Analytics anytime. The 14-day trial period starts from the first time Threat Analytics is enabled. When you are ready to purchase the full license with the Threat Analytics service, contact the Fortinet Sales team.

To enable Threat Analytics:

1. Log in to https://support.fortinet.com/ register the serial number for your FortiAppSec Cloud license. For details, please see Registering Assets.
2. Log in to FortiADC.
3. In the **Dashboard > Status** License widget, check the status ofThreat Analytics. The status should be displayed as Valid.
4. Go to **Security Fabric > Fabric Connectors**. Under Other Fortinet Products section, locate the Threat Analytics connector.
5. Enable Threat Analytics.

   GUI

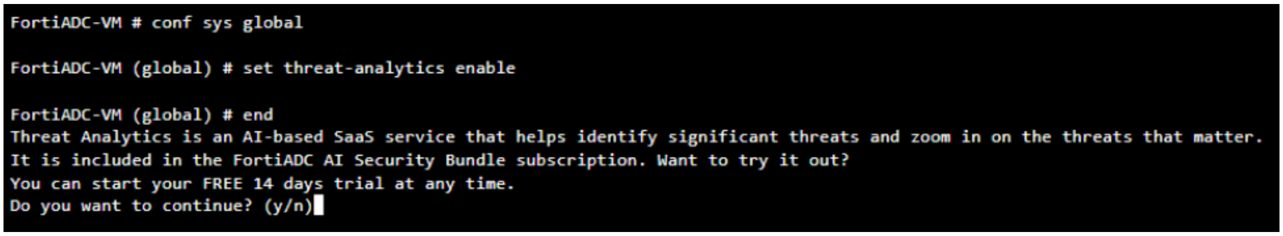
Go to **Security Fabric > Fabric Connectors** and enable the Threat Analytics connector.



CLI

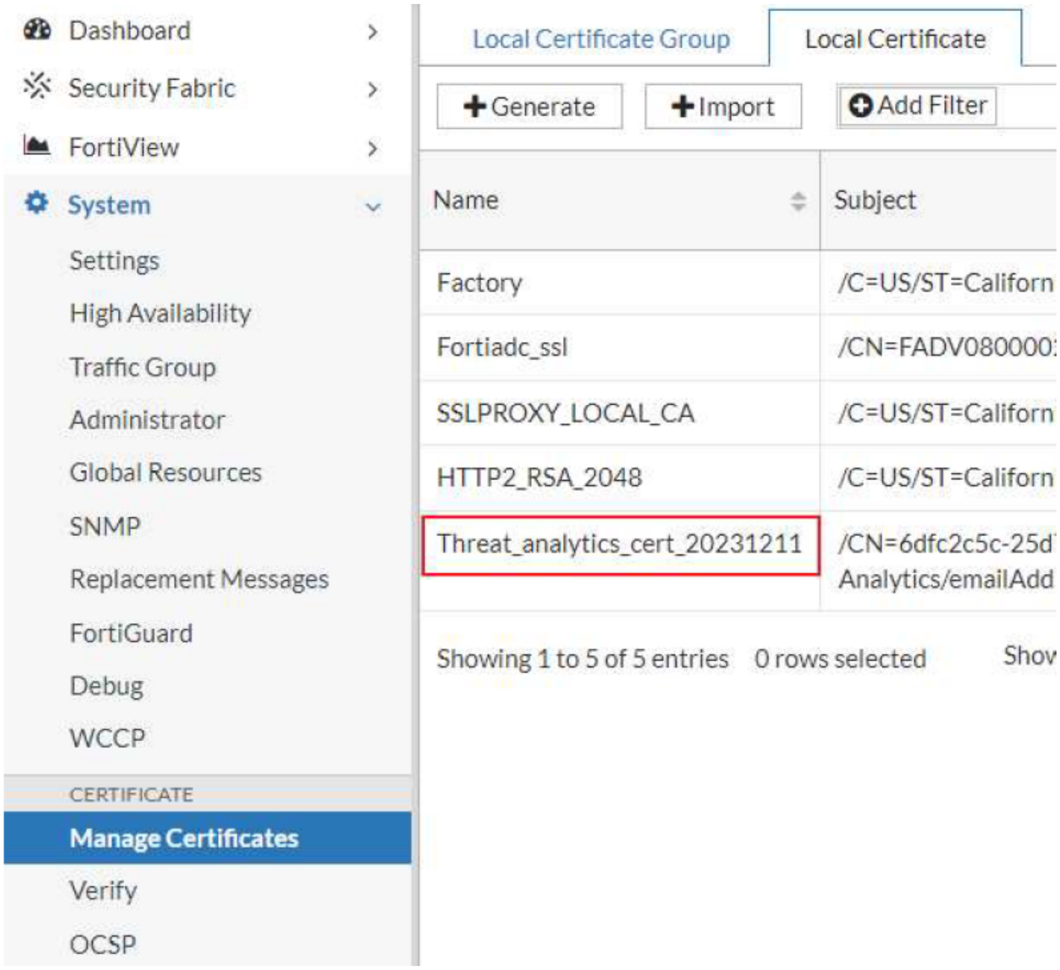
```
config system global
       set threat-analytics enable
       set threat-analytics-authrul <auth-url>
end
```

If you do not have an active Threat Analytics contract, you will receive the following message:



```
FortiADC-VM # conf sys global

FortiADC-VM (global) # set threat-analytics enable

FortiADC-VM (global) # end
Threat Analytics is an AI-based SaaS service that helps identify significant threats and zoom in on the threats that matter.
It is included in the FortiADC AI Security Bundle subscription. Want to try it out?
You can start your FREE 14 days trial at any time.
Do you want to continue? (y/n)
```

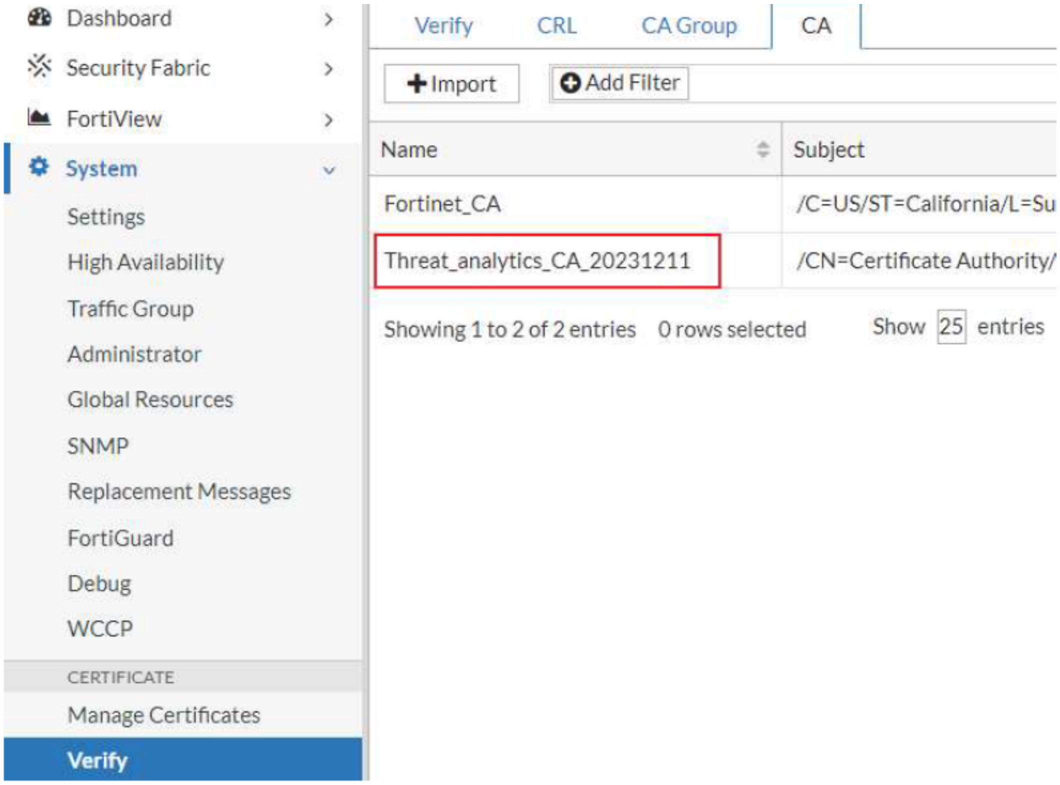
6. Once the Threat Analytics connector successfully connects FortiADC to the Threat Analytics service, a new local certificate and CA will be created. Check the certificates and CA to ensure they are present.
   a. Go to **System > Manage Certificates** to locate the new local certificate with the name *Threat_analytics_cert_<date_of_today>.*



Name	Subject
Factory	/C=US/ST=Californ
Fortiadc_ssl	/CN=FADV080000:
SSLPROXY_LOCAL_CA	/C=US/ST=Californ
HTTP2_RSA_2048	/C=US/ST=Californ
Threat_analytics_cert_20231211	/CN=6dfc2c5c-25d Analytics/emailAdd

Showing 1 to 5 of 5 entries 0 rows selected Shov

b. Go to **System > Verify** to locate the new CA with the name *Threat_analytics_CA_<date_of_today>*.



Name	Subject
Fortinet_CA	/C=US/ST=California/L=Su
Threat_analytics_CA_20231211	/CN=Certificate Authority/

Showing 1 to 2 of 2 entries 0 rows selected Show 25 entries

c. A new syslog global_remote server will be created with the FQDN address type and with the comment *"fweb_cloud"*.

7. Wait to allow FortiADC to generate attack logs and forward them to FortiAppSec Cloud.
8. Log In to FortiAppSec Cloud with the account you used when registering your license on the Fortinet Support site.

Do not delete or modify the syslog remote and certificate/CA entry. Threat Analytics cannot function without these configurations.

Threat Analytics in VDOM

When Threat Analytics is enabled in VDOMs, Override in the Syslog Server configuration will be disabled in order to use the global syslog server. If you have previously enabled Override in the Syslog Server configuration, then the default global syslog server list would be removed and you may use a new syslog server list specifically defined in the VDOM. By default, the new syslog remote server would also be created in all the VDOMs with Threat Analytics enabled, which disables Override in order to use the global syslog server. When Threat Analytics is enabled, it will always use the global or root DNS, and not the VDOM's DNS.

Threat Analytics in HA

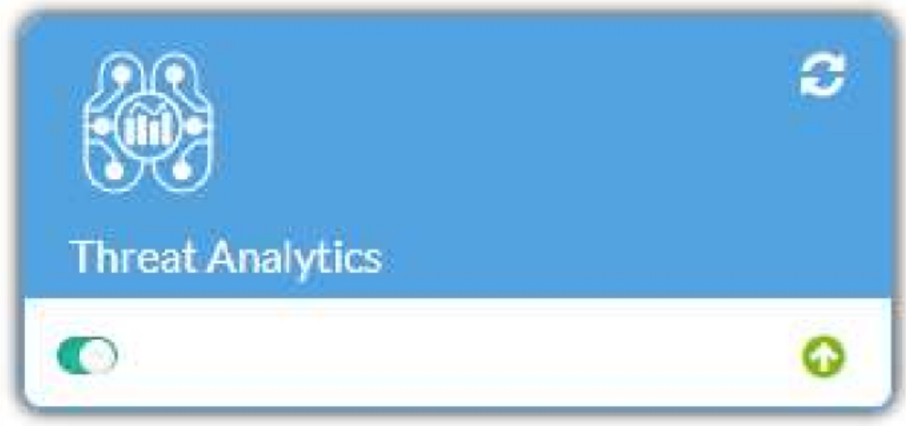
In HA mode, only the primary node is connected to Threat Analytics and then the certification and syslog configurations are synchronized to the secondary. This workflow is designed to prevent HA synchronization issues that can arise with having both the primary and secondary nodes connect to the FortiAppSec Cloud at the same time. As only the primary node is connected to FortiAppSec Cloud, the Threat Analytics status in the secondary node will show as "disconnected".

Threat Analytics troubleshooting and debugging

You can use the following tools to diagnose and troubleshoot Threat Analytics issues in FortiADC

Threat Anaytics connector

When you enable the threat analytics connector, the Threat Analytics service license status will display.



The ⬆ and ⬇ icons indicate whether the Threat Analytics connector has successfully connected to the FortiWeb Cloud server. If the connection is down , FortiADC will first perform an inspection of the Threat Analytics license status to determine whether the connection issue is caused by an invalid license. If a valid Threat Analytics license exists, then further troubleshooting may be required to determine the root cause of the Threat Analytics connection issue.

License Status	Description
0	No license
1	Advanced license
2	Standard license, has not enabled threat analytics before
3	Standard license, has enabled threat analytics before, has not expired.
4	Standard license, expired.

CLI commands to debug logs relating to Threat Analytics

Command	Guidelines
`diagnose debug module wassd`	To view the debug informatio of he wassd daemon. The wassd daemon forms the connection between FortiADC and FortiAppSec Cloud and performs several integral functions when Threat Analytics is enabled. This includes the following:

Command	Guidelines
	• Establishing a web socket connection with the FortiAppSec Cloud using a token. The wassd identifies whether a CA exists before registering to theFortiWeb Cloud. If a CA does exist, then the wassd will send the issue date of the CA certificate to the FortiWeb Cloud. • Updating FortiAppSec Cloud with FortiADC configuration changes, such as HA status changes, member updates, or mode modification. • Updating device certificates received from the FortiAppSec Cloud. Ifwassd registered to the FortiAppSec Cloud without the issue date of the CA or that the certificate has expired, then FortiWeb Cloud will send new certificates (including the certificate, key, and CA) to wassd. The wassd will update to the local certificate and CA table, and register to FortiAppSec Cloud again with the latest CA issue date. • Starting the forwarding of FortiADC attack logs to FortiAppSec Cloud. If wassd has successfully registered to FortiAppSec Cloud, then it will start the action with the log server and port from the FortiWeb Cloud. **Note:** The wassd daemon is create for Threat Analytics and executes the `wassd_ws` Python script when Threat Analytics is enabled. The backend log for the Python script is stored in `/var/log/wassd.log`
`diagnose sysem threat-analytics info`	To view the system information for Threat Analytics

Forwarding FortiWeb attack logs to Threat Analytics

Attack logs on FortiWeb can be forwarded to FortiAppSec Cloud, which allows you to leverage the powerful AI-based Threat Analytics service that helps identify significant threats and zoom in on the threats that matter.

Prerequisites for using Threat Analytics for FortiWeb's attack logs:

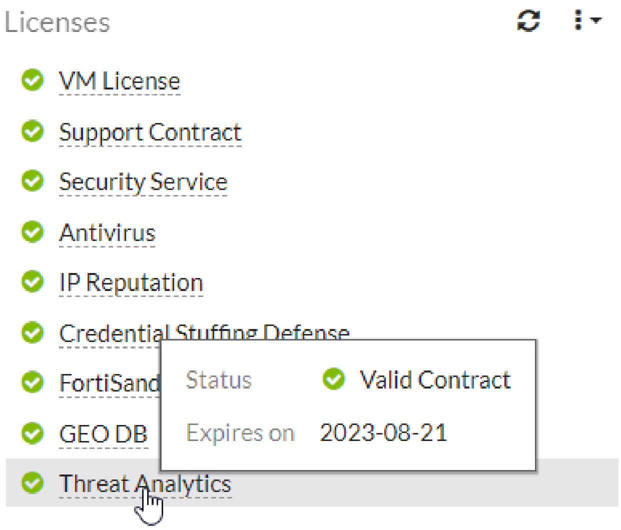
- You have a valid Threat Analytics service license.
- Threat Analytics service is enabled in FortiWeb.

Please note that when your license expires or becomes invalid, the log forwarding will stop immediately regardless whether the Threat Analytics service is enabled.

To enable Threat Analytics:

1. Log in to FortiWeb.

2. Check the status of Threat Analytics in the **Licenses** widget in **Dashboard > Status.** It should be displayed as Valid.

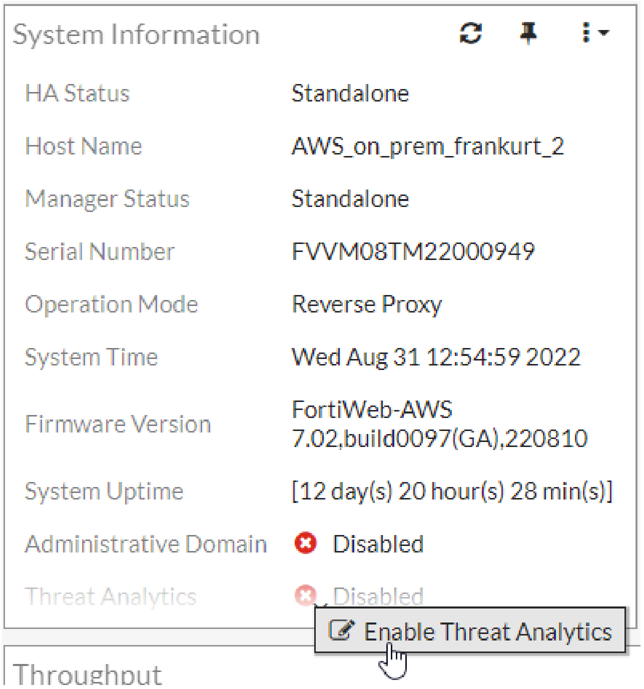


Licenses

- ✓ VM License
- ✓ Support Contract
- ✓ Security Service
- ✓ Antivirus
- ✓ IP Reputation
- ✓ Credential Stuffing Defense
- ✓ FortiSand
- ✓ GEO DB
- ✓ Threat Analytics

Status	✓ Valid Contract
Expires on	2023-08-21

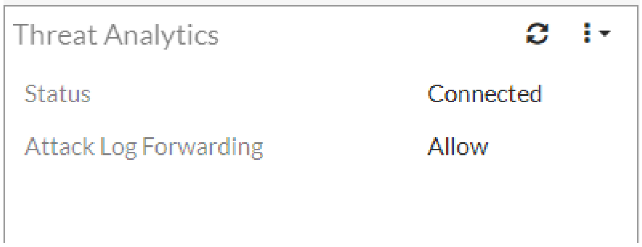
3. In the **System Information** Widget in **Dashboard > Status**, click **Enable Threat Analytics**, then click **OK** in the pop-up window.



System Information

HA Status	Standalone
Host Name	AWS_on_prem_frankurt_2
Manager Status	Standalone
Serial Number	FVVM08TM22000949
Operation Mode	Reverse Proxy
System Time	Wed Aug 31 12:54:59 2022
Firmware Version	FortiWeb-AWS 7.02,build0097(GA),220810
System Uptime	[12 day(s) 20 hour(s) 28 min(s)]
Administrative Domain	✗ Disabled
Threat Analytics	✗ Disabled

4. Make sure **Enable Attack Log** is switched on in **Log&Report > Log Config > Other Log Settings**.
5. Go to **Dashboard > Status**, click **Add Widget**, then select **Threat Analytics** in the **System** section. The **Threat Analytics** widget will be displayed on the **Status** page. You can view whether FortiWeb is successfully connected with FortiAppSec Cloud and whether the attack logs are being forwarded.



Threat Analytics

Status	Connected
Attack Log Forwarding	Allow

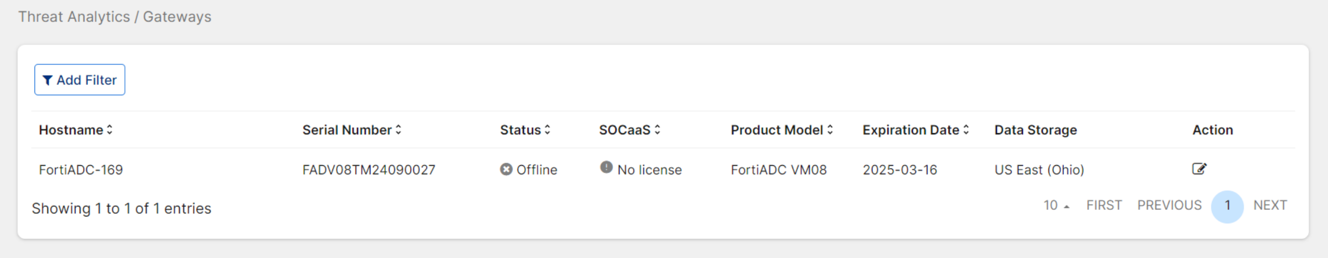
6. Wait for FortiWeb to generate attack logs.
7. Log in to FortiAppSec Cloud with the account you used when registering your license on Fortinet Support site.

Gateways

Use **Gateways** to integrate Threat Analytics with FortiWeb and FortiADC appliances. This allows you to collect attack logs from all your FortiWeb and FortiADC platforms and apply threat analytics across your entire web infrastructure.

You can also configure FortiWeb to send its attack logs to FortiAppSec Cloud's Threat Analytics. For more information, see Forwarding FortiWeb attack logs to Threat Analytics.

The devices connected to Threat Analytics are displayed in the web portal GUI under **Threat Analytics > Gateways**.



Threat Analytics / Gateways

Hostname	Serial Number	Status	SOCaaS	Product Model	Expiration Date	Data Storage	Action
FortiADC-169	FADV08TM24090027	Offline	No license	FortiADC VM08	2025-03-16	US East (Ohio)	

Showing 1 to 1 of 1 entries

Security Operations Center-as-a-Service (SOCaaS)

Fortinet Security Operations Center-as-a-Service (SOCaaS) offers a cloud-based security monitoring service that analyzes security events generated from your FortiAppSec Cloud, performs alert triage, and escalates confirmed threat notifications. Its key services include:

- Real-time web application and API security monitoring
- Clear Call to Action on detected Web Attacks
- Noise reduction of False Positives and Information alerts
- Weekly FortiAppSec Cloud executive and threat protection report

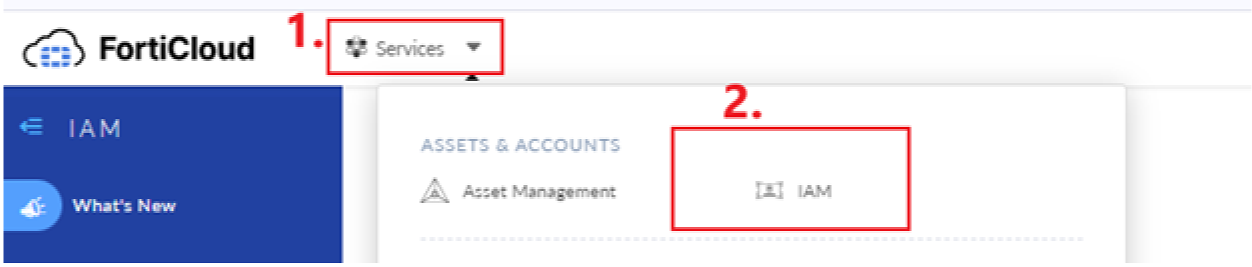
To allow the SOCaaS team to perform essential security operations, grant them access to retrieve attack logs from Threat Analytics on FortiCloud.

Step 1 Create an IAM user for the SOCaaS team on page 347

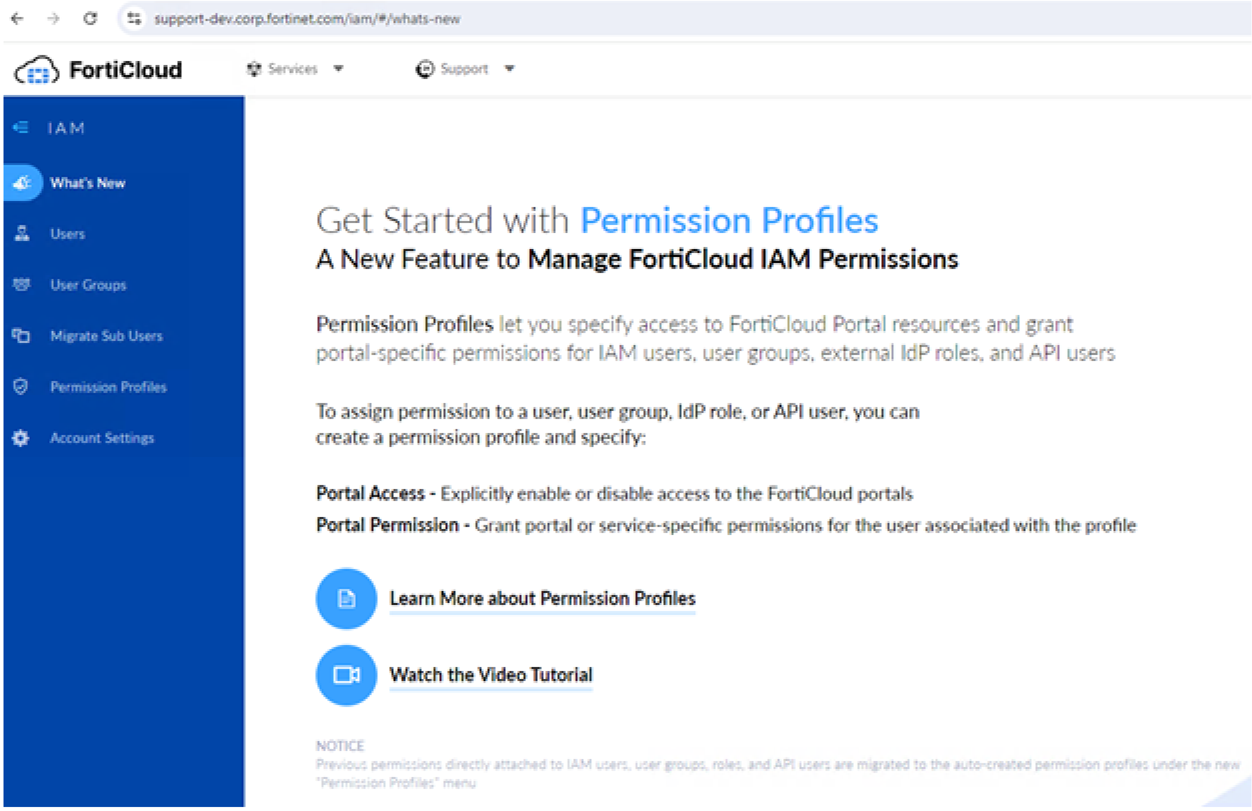
Step 1 Create an IAM user for the SOCaaS team

Step 1.1 Set permission profile for SOCaaS IAM

1. Log in to FortiCloud: https://support.fortinet.com/welcome/#/
2. Select service from top menu and click "IAM" as following:



3. You will see the following page:



Get Started with Permission Profiles

A New Feature to Manage FortiCloud IAM Permissions

Permission Profiles let you specify access to FortiCloud Portal resources and grant portal-specific permissions for IAM users, user groups, external IdP roles, and API users

To assign permission to a user, user group, IdP role, or API user, you can create a permission profile and specify:

Portal Access - Explicitly enable or disable access to the FortiCloud portals

Portal Permission - Grant portal or service-specific permissions for the user associated with the profile

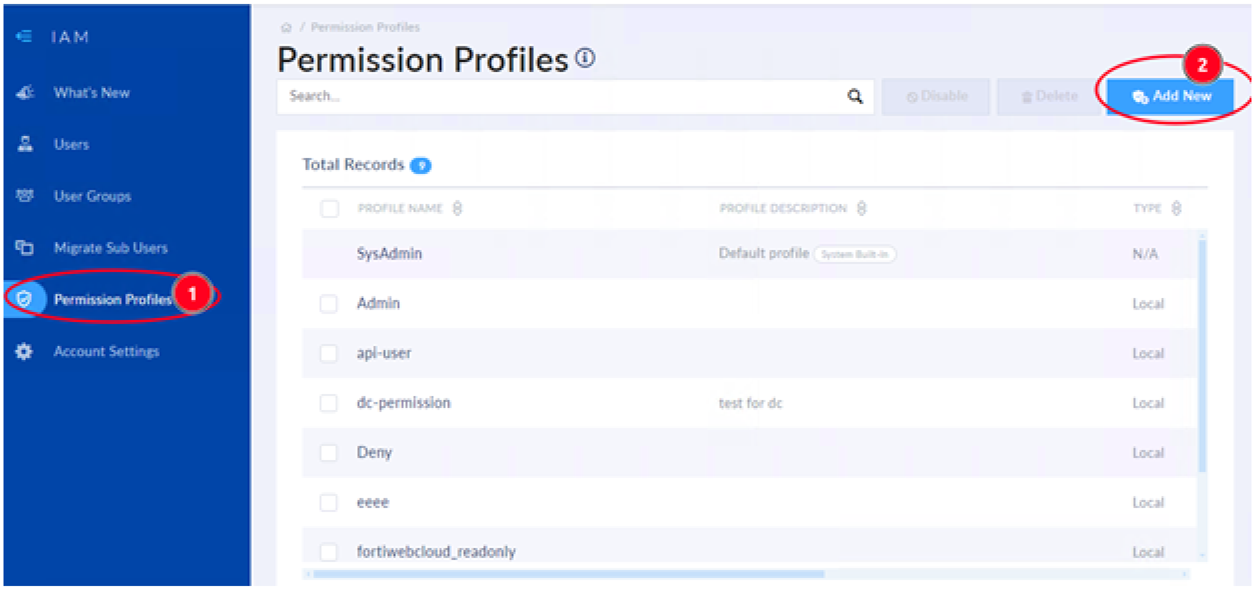
Learn More about Permission Profiles

Watch the Video Tutorial

NOTICE

Previous permissions directly attached to IAM users, user groups, roles, and API users are migrated to the auto-created permission profiles under the new "Permission Profiles" menu

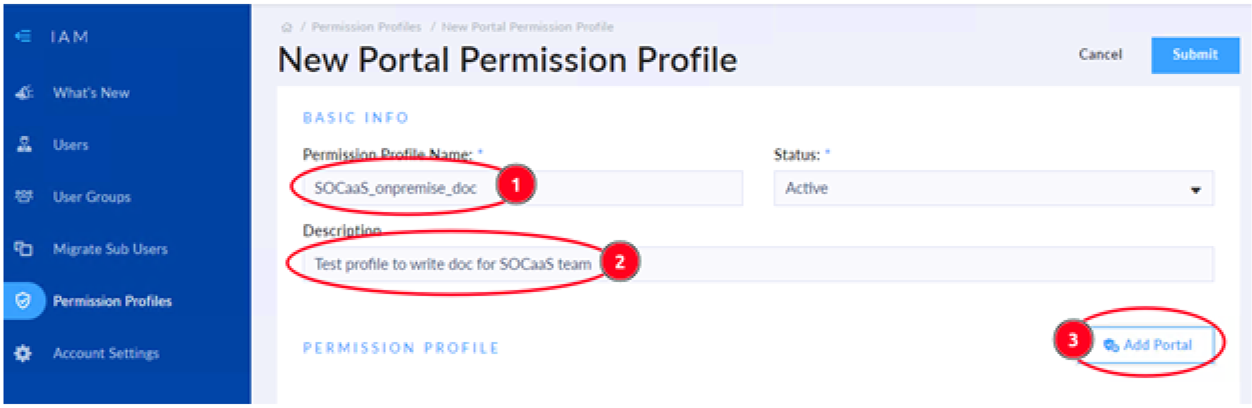
4. Select **Permission Profiles** and click **Add New**:



Total Records 9

	PROFILE NAME	PROFILE DESCRIPTION	TYPE
	SysAdmin	Default profile System Built-in	N/A
□	Admin		Local
□	api-user		Local
□	dc-permission	test for dc	Local
□	Deny		Local
□	eeee		Local
□	fortiwebcloud_readonly		Local

5. Enter permission profile name and optional description and click **Add Portal**.

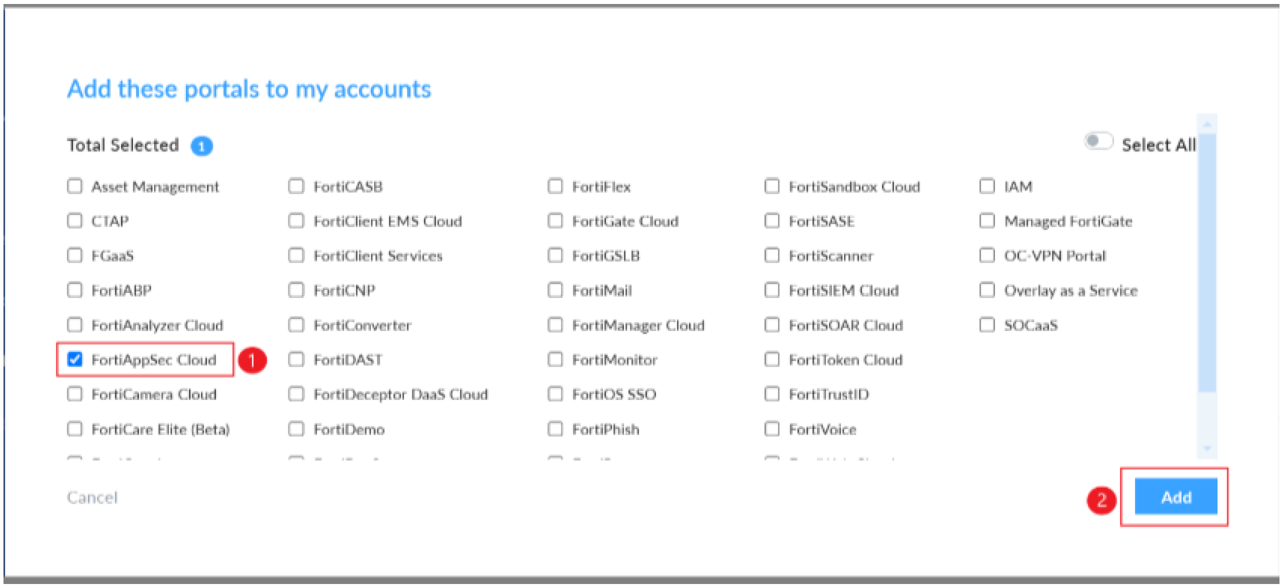


Permission Profile Name: * SOCaaS_onpremise_doc

Status: * Active

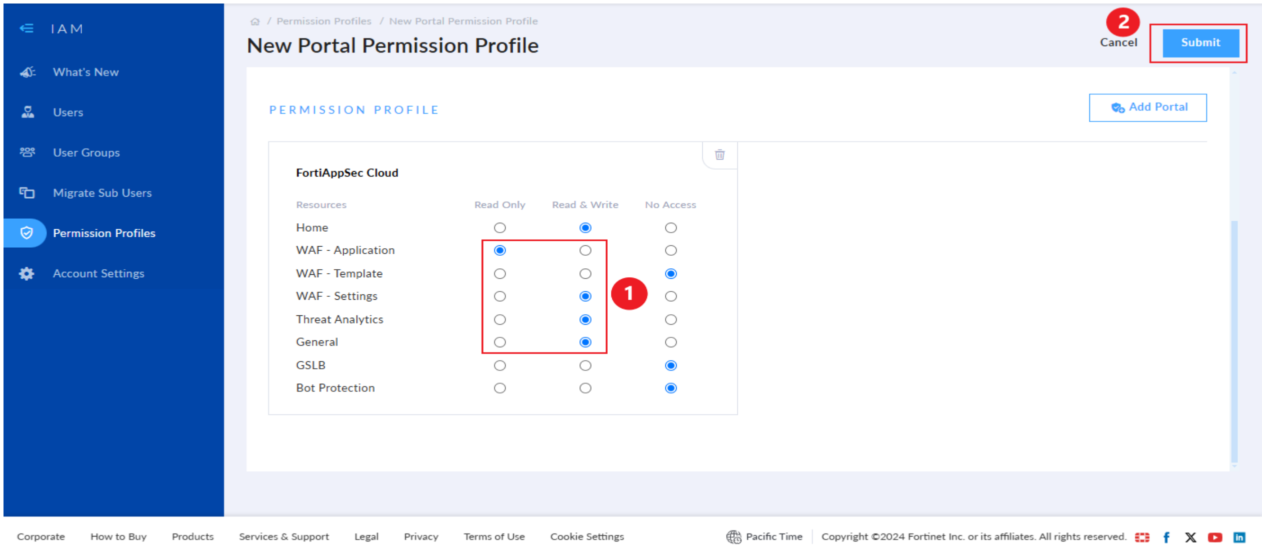
Description: Test profile to write doc for SOCaaS team

6. Check **FortiAppSec Cloud** box and click **Add**.



□ Asset Management
□ CTAP
□ FGaaS
□ FortiABP
□ FortiAnalyzer Cloud
☑ FortiAppSec Cloud
□ FortiCamera Cloud
□ FortiCare Elite (Beta)
□ FortiCASB
□ FortiClient EMS Cloud
□ FortiClient Services
□ FortiCNP
□ FortiConverter
□ FortiDAST
□ FortiDeceptor DaaS Cloud
□ FortiDemo
□ FortiFlex
□ FortiGate Cloud
□ FortiGSLB
□ FortiMail
□ FortiManager Cloud
□ FortiMonitor
□ FortiOS SSO
□ FortiPhish
□ FortiSandbox Cloud
□ FortiSASE
□ FortiScanner
□ FortiSIEM Cloud
□ FortiSOAR Cloud
□ FortiToken Cloud
□ FortiTrustID
□ FortiVoice
□ IAM
□ Managed FortiGate
□ OC-VPN Portal
□ Overlay as a Service
□ SOCaaS

7. Set **General** and **Threat Analytics** to **Read & Write**. Click **Submit**.



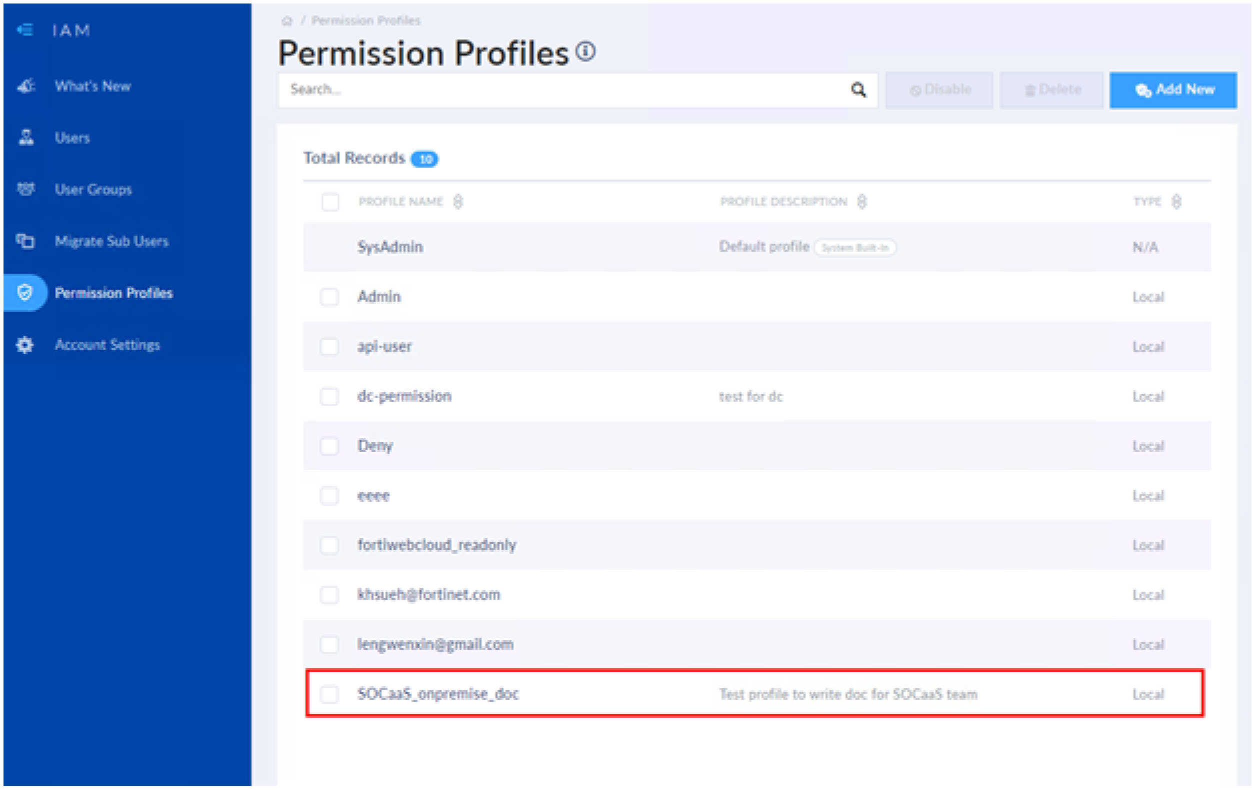
New Portal Permission Profile

PERMISSION PROFILE

FortiAppSec Cloud

Resources	Read Only	Read & Write	No Access
Home	○	●	○
WAF - Application	●	○	○
WAF - Template	○	○	●
WAF - Settings	○	●	○
Threat Analytics	○	●	○
General	○	●	○
GSLB	○	○	●
Bot Protection	○	○	●

8. A new permission profile is added successfully.



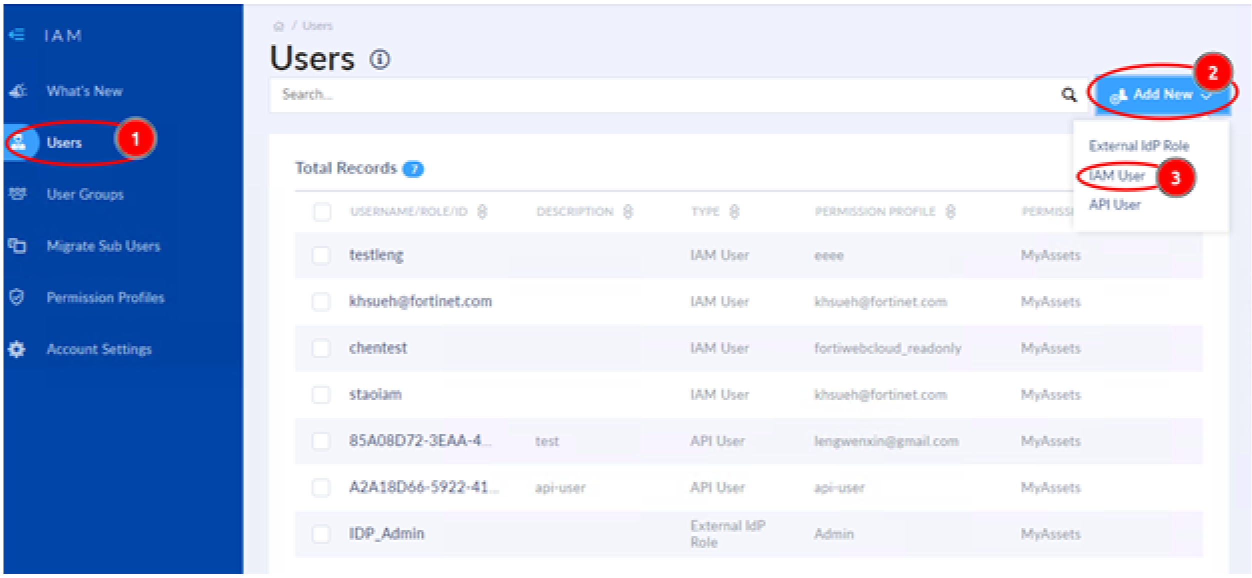
Permission Profiles

Total Records 10

PROFILE NAME	PROFILE DESCRIPTION	TYPE
SysAdmin	Default profile System Built-In	N/A
Admin		Local
api-user		Local
dc-permission	test for dc	Local
Deny		Local
eeee		Local
fortiwebcloud_readonly		Local
khsueh@fortinet.com		Local
lengwenxin@gmail.com		Local
SOCaaS_onpremise_doc	Test profile to write doc for SOCaaS team	Local

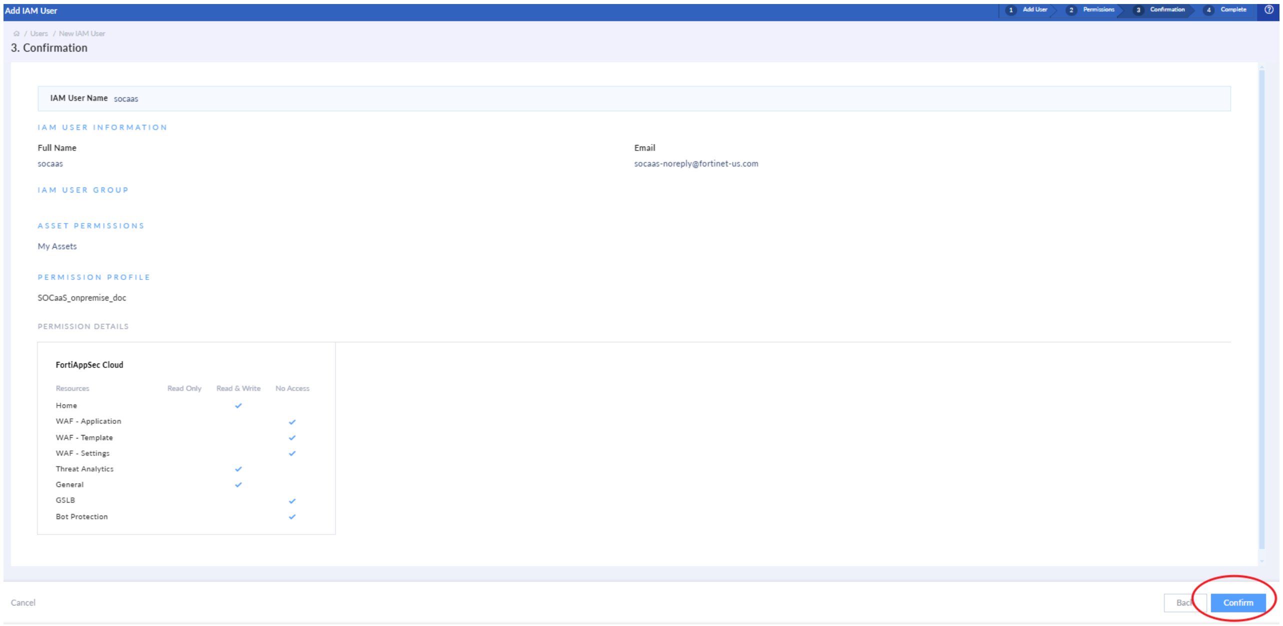
Step 1.2 Create a user for SOCaaS team

1. Select **Users**, click **Add New**, then then click **IAM User**.



USERNAME/ROLE/ID	DESCRIPTION	TYPE	PERMISSION PROFILE	PERMISSI
testleng		IAM User	eeee	MyAssets
khsueh@fortinet.com		IAM User	khsueh@fortinet.com	MyAssets
chentest		IAM User	fortiwebcloud_readonly	MyAssets
staoiam		IAM User	khsueh@fortinet.com	MyAssets
85A08D72-3EAA-4...	test	API User	lengwenxin@gmail.com	MyAssets
A2A18D66-5922-41...	api-user	API User	api-user	MyAssets
IDP_Admin		External IdP Role	Admin	MyAssets

2. Input the **Username**, **Full Name**, **Email** and **Phone**, then click **Next.** For the email address, use “`socaas-noreply@fortinet-us.com`”.
3. select a **Asset Folder**. then select the permission profile created in the last step. Click **Next.**



3. Confirmation

IAM User Name socaas

IAM USER INFORMATION

Full Name
socaas

Email
socaas-noreply@fortinet-us.com

IAM USER GROUP

ASSET PERMISSIONS

My Assets

PERMISSION PROFILE

SOCaaS_onpremise_doc

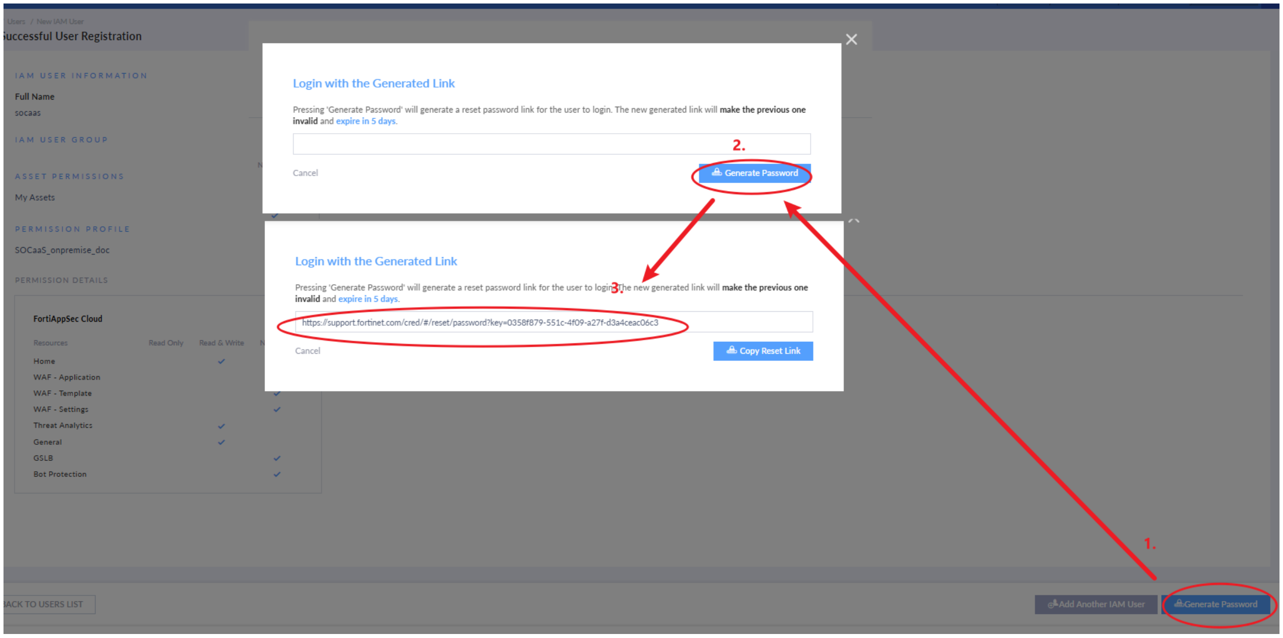
PERMISSION DETAILS

FortiAppSec Cloud

Resources	Read Only	Read & Write	No Access
Home		✓	
WAF - Application			✓
WAF - Template			✓
WAF - Settings			✓
Threat Analytics		✓	
General		✓	
GSLB			✓
Bot Protection			✓

4. Click **Confirm**, the IAM user is created successfully.

5. Click **Generate Password**. The link will be displayed and click **Copy Reset Link** to copy the link.



Full Name
socaas

My Assets

SOCaaS_onpremise_doc

FortiAppSec Cloud

Resources	Read Only	Read & Write	N
Home		✓	
WAF - Application			
WAF - Template			✓
WAF - Settings			✓
Threat Analytics		✓	
General		✓	
GSLB			✓
Bot Protection			✓

Login with the Generated Link

Pressing 'Generate Password' will generate a reset password link for the user to login. The new generated link will **make the previous one invalid** and expire in 5 days.

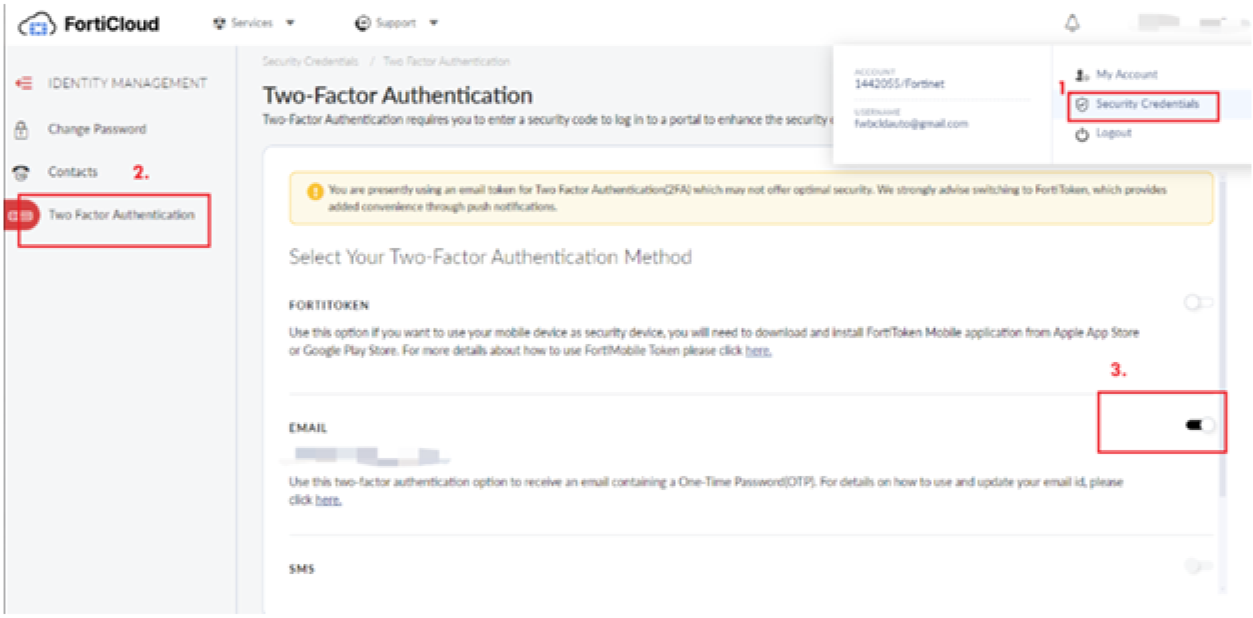
Login with the Generated Link

Pressing 'Generate Password' will generate a reset password link for the user to login. The new generated link will **make the previous one invalid** and expire in 5 days.

https://support.fortinet.com/cred/#/reset/password?key=0358f879-551c-4f09-a27f-d3a4ceac06c3

Step 1.3 Share the password link with SOCaaS team

1. Copy and share the **Generate password** link with the SOCaaSTeam over email `socaas@fortinet.com`. SOCaaS team will set its own password.
2. Verify TFA setting and make sure it is set to **Email**, not **FortiToken**. As shown below, you need to switch on the **Email** button.



Two-Factor Authentication

Two-Factor Authentication requires you to enter a security code to log in to a portal to enhance the security

ACCOUNT
1442055/Fortinet

USERNAME
fwbckdauto@gmail.com

You are presently using an email token for Two Factor Authentication(2FA) which may not offer optimal security. We strongly advise switching to FortiToken, which provides added convenience through push notifications.

Select Your Two-Factor Authentication Method

FORTITOKEN

Use this option if you want to use your mobile device as security device, you will need to download and install FortiToken Mobile application from Apple App Store or Google Play Store. For more details about how to use FortiMobile Token please click here.

EMAIL

[redacted]

Use this two-factor authentication option to receive an email containing a One-Time Password(OTP). For details on how to use and update your email id, please click here.

SMS

Step 2 Wait for the SOCaaS team to complete configuration

When onboarding FortiAppSec Cloud to SOCaaS, the process typically involves a waiting period for configuration and service preparation.

Once the configurations are complete, the SOCaaS team will contact you via email to confirm that the SOCaaS service for your FortiAppSec Cloud service is ready.

Step 3 Onboard your application on SOCaaS

The final step is to onboard your application on Fortinet SOCaaS. For detailed instructions, please refer to the following article: Onboarding FortiWeb or FortiAppSec Cloud.

General

This section covers information that applies to all services of your account, covering account-wide settings and logs collected from each service.

- Settings on page 354
- Audit Logs on page 356
- Contracts on page 358
- Usage on page 361
- Reports on page 362
- Organization on page 363

Settings

Audit Logs Export

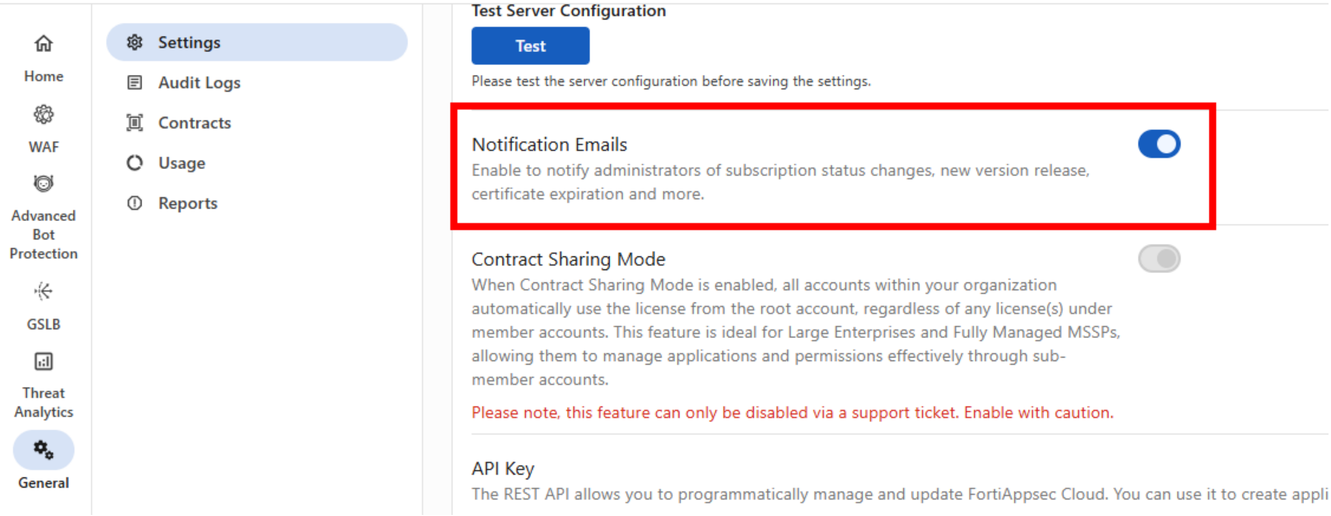
Enable to export system-level events such as user login and server creation to specified log servers.

Server Type	Select whether to export the logs to a log server or an ElasticSearch service. See the following instructions for SysLog and ElasticSearch.
SysLog	
IP/Domain and Port	Enter the IP/Domain and Port of the log server.
Protocol	Select the protocol used for log transfer.
Server Certificate Verification	When enabled, the system will enforces server certificate verification before it sends attack logs to the log server.
Custom Certificate and Key	• **Off:**FortiAppSec Cloud automatically retrieves the SSL certificate used to encrypt the HTTPS connections between the log server and FortiAppSec Cloud. • **On:** Manually enter the SSL certificate. Available only if you select **SSL** in **Protocol**.
Client Certificate	Fill in the Certificate field. Available only if you enabled **Custom Certificate and Key**.
Private Key	Fill in the Private Key field. Available only if you enabled **Custom Certificate and Key**.
Password	Enter the password of the private key. Available only if you enabled **Custom Certificate and Key**.
Log Format	• **Default:** Export logs in default format. • **Custom:** Customize the log format. All the supported parameters are listed by default. You can select the ones that you need, and delete the others. • **Splunk**: Export logs to Splunk log server. • **CEF:0 (ArcSight):** Export logs in CEF:0 format. • **Microsoft Azure OMS:** Export logs in Microsoft Azure OMS format. • **LEEF1.0(QRadar):** Export logs in LEEF1.0 format.
Log Facility	Select the source facility of the logs. We only support the local use facilities which are not reserved and are available for general use.
ElasticSearch ElasticSearch is a search engine providing a distributed, multitenant-capable full-text search engine with an HTTP web interface and schema-free JSON documents.	
Address and Port	Enter the address and port to access your ElasticSearch service. The default port for ElasticSearch service is 9200.
User Name	Enter the user name of the ElasticSearch service.
Password	Enter the password of the ElasticSearch service user.

Notification Emails

FortiAppSec Cloud sends notifications to your email about the information related with subscription, new features in each release, system maintenance, certificate expiration and more.

Enable **Notification Emails** in **General > Settings** to send notification emails to your registered email address.



Test Server Configuration

Please test the server configuration before saving the settings.

Notification Emails

Enable to notify administrators of subscription status changes, new version release, certificate expiration and more.

Contract Sharing Mode

When Contract Sharing Mode is enabled, all accounts within your organization automatically use the license from the root account, regardless of any license(s) under member accounts. This feature is ideal for Large Enterprises and Fully Managed MSSPs, allowing them to manage applications and permissions effectively through sub-member accounts.

Please note, this feature can only be disabled via a support ticket. Enable with caution.

API Key

The REST API allows you to programmatically manage and update FortiAppsec Cloud. You can use it to create appli

Contract Sharing Mode

When Contract Sharing Mode is enabled, all accounts within your organization will use the license from the root account, regardless of any license(s) under member accounts. This feature is ideal for Large Enterprises and Fully Managed MSSPs, allowing them to manage applications and permissions effectively through sub-member accounts.

API Key

FortiAppSec Cloud RESTful API requires API key authorization. You can generate the API key from the GUI directly. Please note that API key creation does not restrict only to users with write permission. Read-only users can also create an API key.

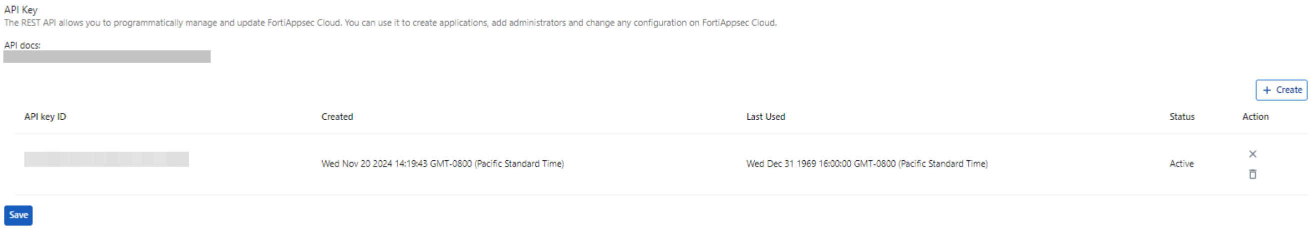
Please note, the API key’s permissions are bound to the user who created it.

For API documentation, see the FortiAppSec Cloud RESTful API Reference.

Generating API Key

1. Log into your FortiAppSec Cloud account through the Web UI.
2. Go to **General > Settings**.
3. Scroll down to **API Key**.
4. Click **Create**. This will generate an API key ID and API key secret.

You only have **one** chance to view the API key secret, so make sure you save it in a secure location. The key secret will not be stored at the back-end server.



API Key

The REST API allows you to programmatically manage and update FortiAppsec Cloud. You can use it to create applications, add administrators and change any configuration on FortiAppsec Cloud.

API docs: [redacted]

API key ID	Created	Last Used	Status	Action
[redacted]	Wed Nov 20 2024 14:19:43 GMT-0800 (Pacific Standard Time)	Wed Dec 31 1969 16:00:00 GMT-0800 (Pacific Standard Time)	Active	× 🗑

In the API Key table, you can see the API key ID, creation and last usage timestamps, as well as its active or deactivated status. If you encounter any security issues with the key, you have the option to deactivate it. Please note that if your API Key is leaked, we might deactivate it as a precautionary measure. Each user is limited to creating only one API key at a time. If needed, you can delete an existing API key before generating a new one.

When using this API key, add it to the HTTP authentication header as below:

```
authentication: Basic <api-key-secret>
```

Please note, exceeding the limit of failed attempts (3 times) will result in a 30-minute cool down period for further requests. Failed attempts can accumulate due to the following four scenarios:

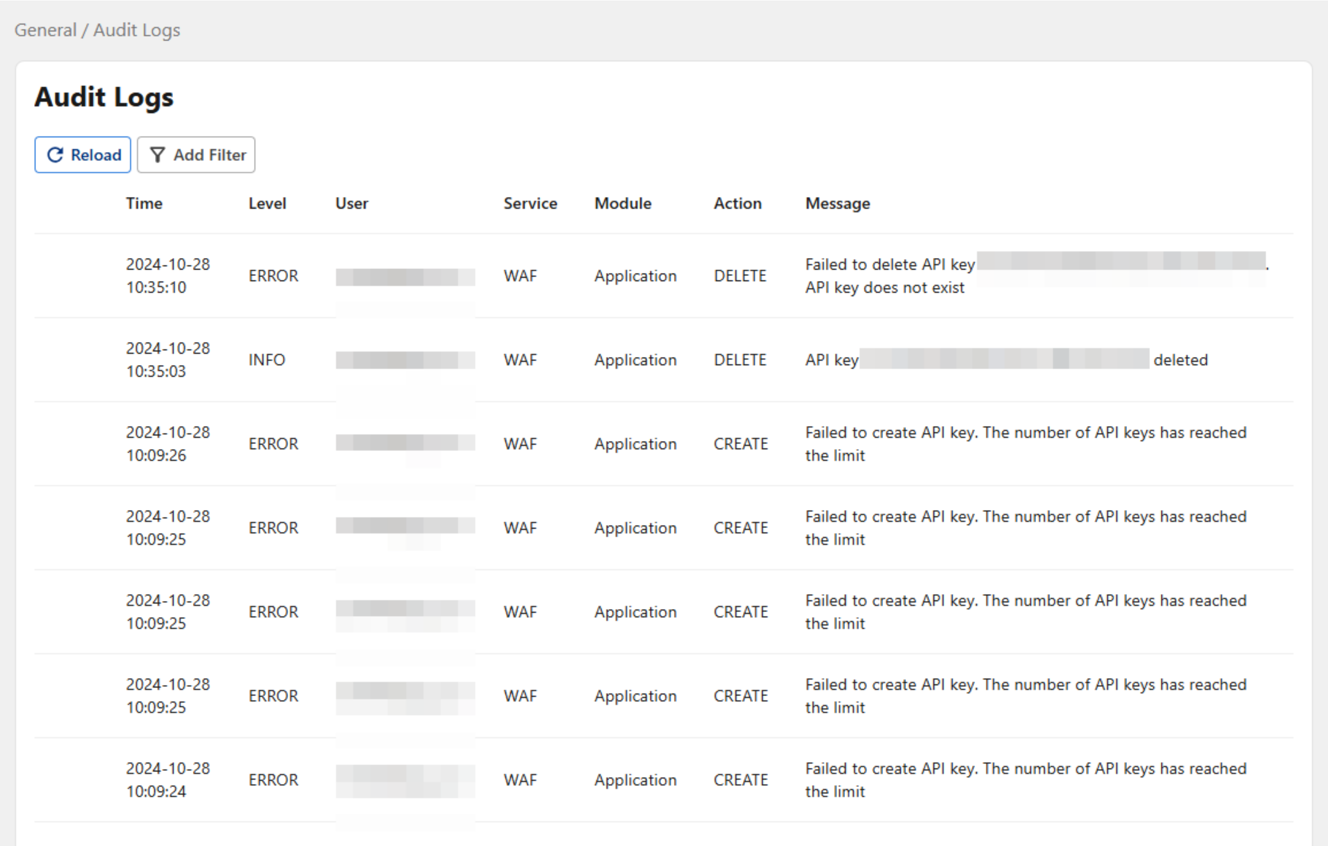
1. Cannot find the corresponding user on FortiCloud.
2. The API key is illegal.
3. Do not have any valid licenses.
4. Using a deactivated API key.

We have implemented rate limiting, allowing a maximum of 200 requests per minute. This limit applies to both IP addresses and API keys.

Audit Logs

The audit log records system activities such as user login and logout, and issues warnings for personal licenses. It triggers reminders in the log if a license is due to expire within 1, 3, or 15 days. Additionally, it notifies when all query license capacities are exhausted.

Primary users can access all audit logs, while sub-users can only view their own audit logs.



Audit Logs

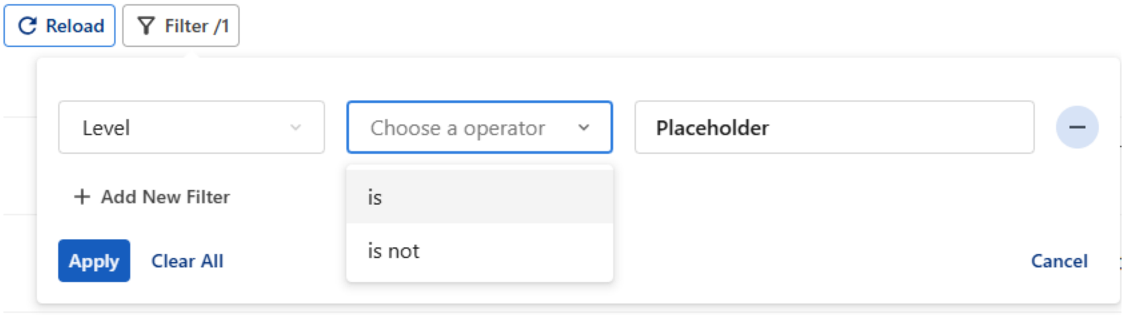
Time	Level	User	Service	Module	Action	Message
2024-10-28 10:35:10	ERROR	[redacted]	WAF	Application	DELETE	Failed to delete API key [redacted]. API key does not exist
2024-10-28 10:35:03	INFO	[redacted]	WAF	Application	DELETE	API key [redacted] deleted
2024-10-28 10:09:26	ERROR	[redacted]	WAF	Application	CREATE	Failed to create API key. The number of API keys has reached the limit
2024-10-28 10:09:25	ERROR	[redacted]	WAF	Application	CREATE	Failed to create API key. The number of API keys has reached the limit
2024-10-28 10:09:25	ERROR	[redacted]	WAF	Application	CREATE	Failed to create API key. The number of API keys has reached the limit
2024-10-28 10:09:25	ERROR	[redacted]	WAF	Application	CREATE	Failed to create API key. The number of API keys has reached the limit
2024-10-28 10:09:24	ERROR	[redacted]	WAF	Application	CREATE	Failed to create API key. The number of API keys has reached the limit

Field	Description
Time	The local time when the event occurred.
Level	The system's assessment of the urgency level for this logged event. **Emergency**: This is the most severe level, indicating a catastrophic failure or situation that requires immediate attention and action. **Alert**: This level indicates a critical situation where immediate action is required from the customer. **Critical**: This level denotes a severe error or failure that affects the system's functionality. **Warning**: This level signifies a potential problem or issue that the customer should be aware of and investigate further. **Notice**: This level provides insight into the cause of an error or an unusual event. **Info**: This level conveys general informational messages that are useful for tracking system activities or providing updates. **Debug**: This level is used for detailed debugging information.
User	If the event pertains to a user in your organization, their username will be displayed in this field; otherwise, it will show as **None**.
Service	The service that detected this event.
Module	This field describes the nature of the log.

Field	Description
	system: Tracks system events like licensing changes and user logins. **config**: Configuration events, such as a newly configured FQDN **health_check**: Monitors system health through tests and alerts for issues like overloads or status changes. **connector**: Keeps tabs on the health and function of connectors, essential for data flow and system connections.
Action	This field specifies the action recorded in this audit log, offering more detail than the **Type** field.
Status	The outcome of the event, indicating success or failure.
Message	Details regarding the event as gathered from the system.

Filters

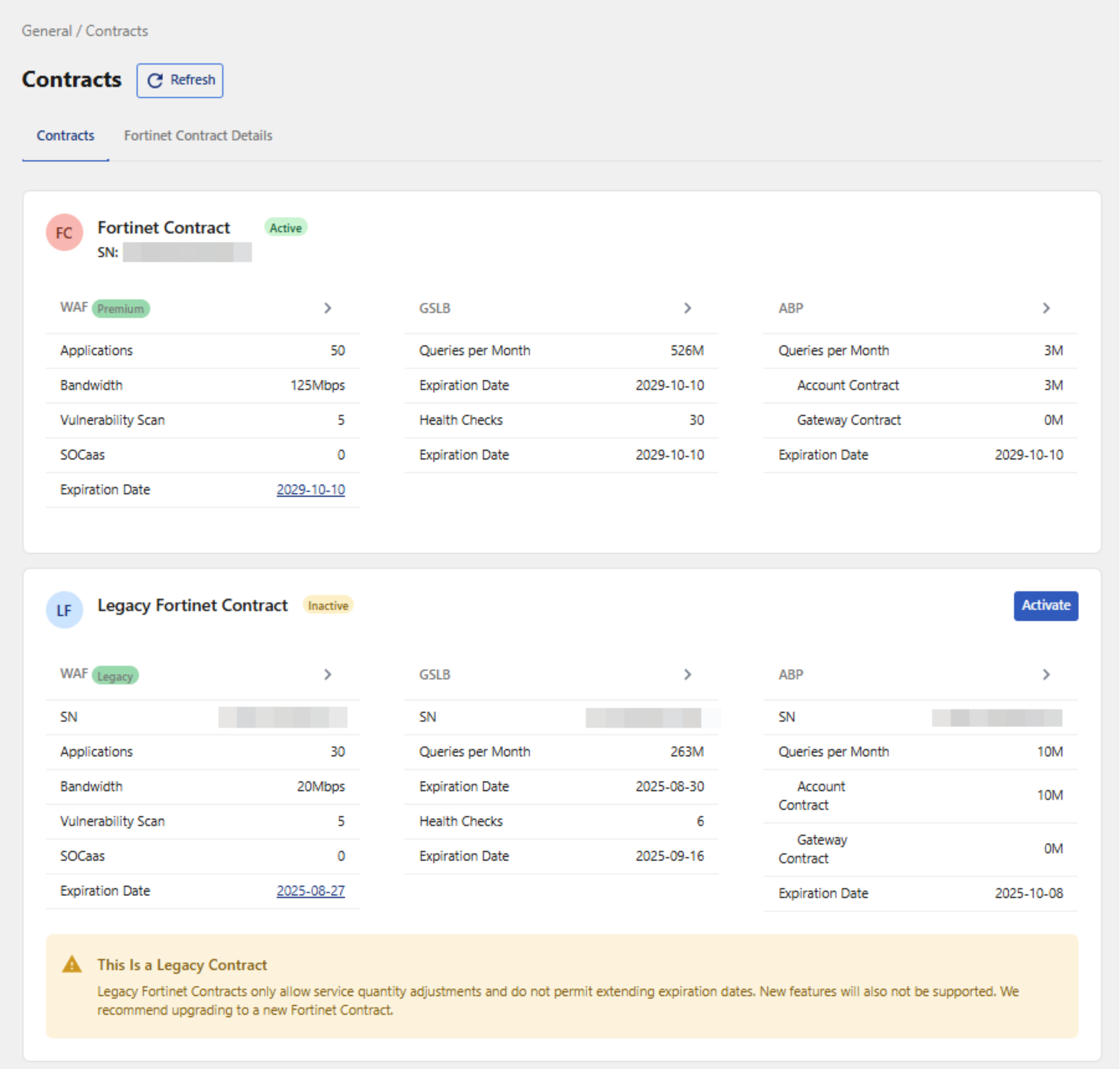
Customize your log views by specifying a date range and by adding filters (by Time, Level, Message, Service, User, and Action).



Contracts

On this page, you can view your active licenses, license history, and query usage.

View contracts



General / Contracts

Contracts Refresh

Contracts | Fortinet Contract Details

FC **Fortinet Contract** Active

SN: [redacted]

WAF Premium		GSLB		ABP	
Applications	50	Queries per Month	526M	Queries per Month	3M
Bandwidth	125Mbps	Expiration Date	2029-10-10	Account Contract	3M
Vulnerability Scan	5	Health Checks	30	Gateway Contract	0M
SOCaas	0	Expiration Date	2029-10-10	Expiration Date	2029-10-10
Expiration Date	2029-10-10				

LF **Legacy Fortinet Contract** Inactive Activate

WAF Legacy		GSLB		ABP	
SN	[redacted]	SN	[redacted]	SN	[redacted]
Applications	30	Queries per Month	263M	Queries per Month	10M
Bandwidth	20Mbps	Expiration Date	2025-08-30	Account Contract	10M
Vulnerability Scan	5	Health Checks	6	Gateway Contract	0M
SOCaas	0	Expiration Date	2025-09-16	Expiration Date	2025-10-08
Expiration Date	2025-08-27				

⚠ **This Is a Legacy Contract**

Legacy Fortinet Contracts only allow service quantity adjustments and do not permit extending expiration dates. New features will also not be supported. We recommend upgrading to a new Fortinet Contract.

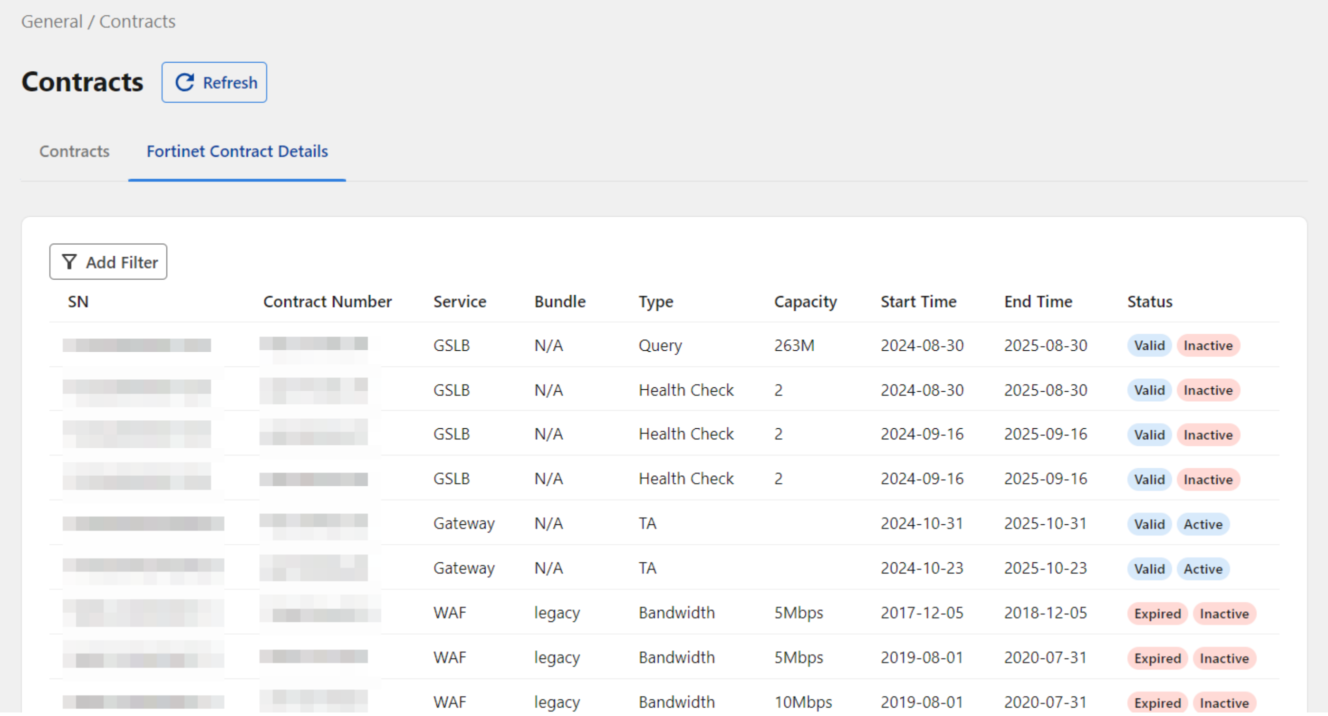
Change Contract

1. Purchase a FortiAppSec Cloud contract by contacting your Fortinet reseller.
2. After purchasing the new contract, please log into your FortiAppSec Cloud portal and navigate to **General > Contracts**.

   Only one contract can be active at a time. Before activating your new contract, your previous contract will remain active.
3. Click **Activate** in the new contract to activate it.

Fortinet Contract Details

View the serial numbers, contract numbers, capacity, and additional details for all individual services associated with your license.



General / Contracts

Contracts Refresh

SN	Contract Number	Service	Bundle	Type	Capacity	Start Time	End Time	Status
[redacted]	[redacted]	GSLB	N/A	Query	263M	2024-08-30	2025-08-30	Valid Inactive
[redacted]	[redacted]	GSLB	N/A	Health Check	2	2024-08-30	2025-08-30	Valid Inactive
[redacted]	[redacted]	GSLB	N/A	Health Check	2	2024-09-16	2025-09-16	Valid Inactive
[redacted]	[redacted]	GSLB	N/A	Health Check	2	2024-09-16	2025-09-16	Valid Inactive
[redacted]	[redacted]	Gateway	N/A	TA		2024-10-31	2025-10-31	Valid Active
[redacted]	[redacted]	Gateway	N/A	TA		2024-10-23	2025-10-23	Valid Active
[redacted]	[redacted]	WAF	legacy	Bandwidth	5Mbps	2017-12-05	2018-12-05	Expired Inactive
[redacted]	[redacted]	WAF	legacy	Bandwidth	5Mbps	2019-08-01	2020-07-31	Expired Inactive
[redacted]	[redacted]	WAF	legacy	Bandwidth	10Mbps	2019-08-01	2020-07-31	Expired Inactive

License Expiration

As your contract approaches its expiration date, you will receive an email notification providing the expiration date and the scheduled date for permanent data deletion.

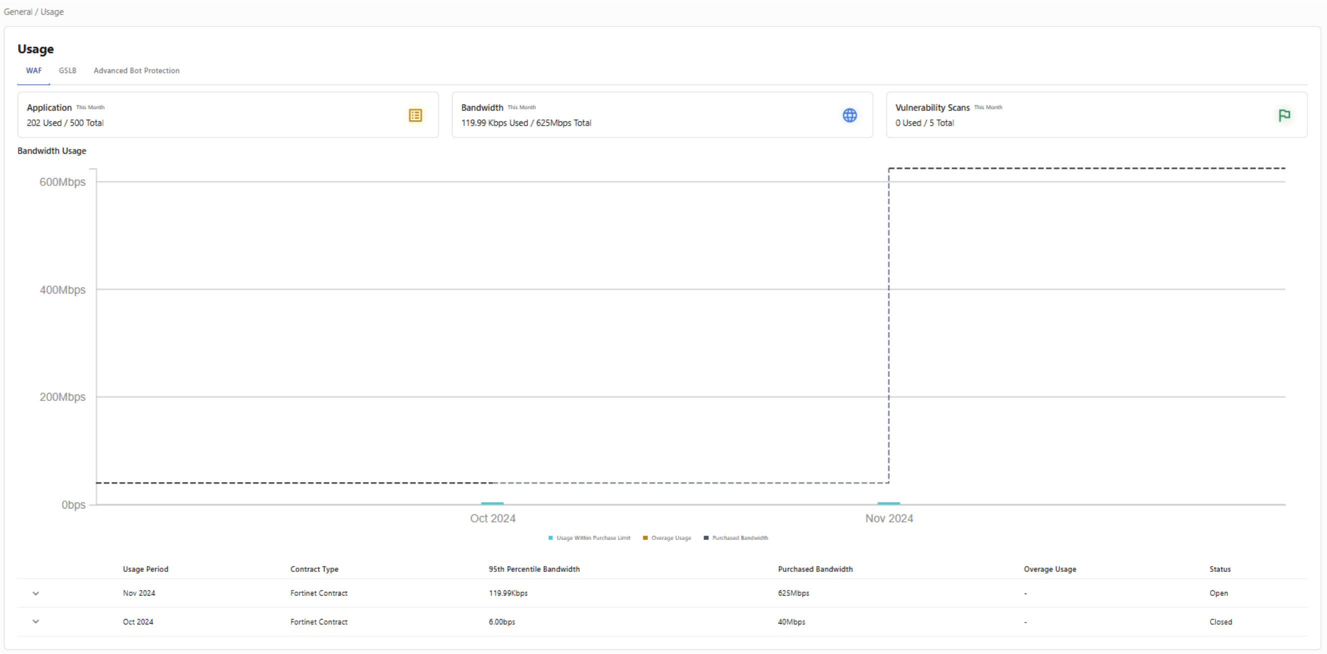
- If the contract is not renewed by the expiration date, your account will transition to read-only mode, restricting any configuration changes through the web portal.
- If the contract is not renewed by the scheduled date for data deletion, all account data, including configurations and logs, will be permanently deleted.

To renew an existing FortiAppSec Cloud contract, please contact Fortinet Sales to adjust the quantity or expiration date of your contract.

If you would like to change contract types; such as from Standard to Premium, or from a Legacy contract to a FortiAppSec Cloud contract; please contact Fortinet Sales to purchase the new FortiAppSec Cloud Fortinet Contract. Once you have obtained the new contract, activate it by navigating to **General > Contract**, and click **Activate** in the new contract.

Usage

The Usage page gives you a clear overview of how your account has been used over time. It breaks down usage for each month of service, helping you easily identify your usage patterns and detect any overages in your account without delay.



Application This Month
202 Used / 500 Total

Bandwidth This Month
119.99 Kbps Used / 625Mbps Total

Vulnerability Scans This Month
0 Used / 5 Total

	Usage Period	Contract Type	95th Percentile Bandwidth	Purchased Bandwidth	Overage Usage	Status
⌄	Nov 2024	Fortinet Contract	119.99Kbps	625Mbps	-	Open
⌄	Oct 2024	Fortinet Contract	6.00bps	40Mbps	-	Closed

This page will display usage statistics at the top, tailored to the selected service, showing how much of each resource has been used relative to its limits.

- **WAF**
  - **Application**- the number of applications onboarded to WAF
  - **Bandwidth**- the amount of data transmitted between your applications and FortiAppSec Cloud for protection and security filtering. This includes data traffic that is analyzed and monitored for threats such as attacks, malicious requests, and other security risks.
  - **Vulnerability Scans**- the number of times the Vulnerability Scan feature was triggered.
- **GSLB**
  - **Queries** - the number of queries exchanged between your GSLB service and WAF/FortiADC/FortiWeb regarding user activity on the protected application.
  - **Health Checks**- the total number of health checks utilized by your service.
- **Advanced Bot Protection**
  - **Queries**- the number of queries exchanged between your ABP service and WAF/FortiADC/FortiWeb regarding user activity on the protected application.

The following display for all services:

Account Usage graph

This bar chart displays your account's bandwidth usage history over a period of up to a year. Simply hover over a bar representing a specific month to view the exact usage figures for that month.

Usage table

This table further breaks down the statistics for each month displayed in the Account Usage chart.

Field	Description
Contract Type	This field specifies the channel you used to subscribe to FortiWeb Cloud, such as Fortinet or FortiFlex.
95th percentile bandwidth	FortiWeb Cloud measures each account using a burstable model for overall account bandwidth calculation. The model is based on calculating the 95th percentile of bandwidth usage of clean traffic and is also common with other CDNs and Cloud solutions. The 95th percentile bandwidth is calculated in the following way: Traffic for the entire month is measured in 5 minute buckets. At the end of the month, the 5% of buckets with the most Mbps are dropped, and the highest Mbps rate of the remaining buckets represents the 95th percentile value for the account. At the beginning of every month, the 95th percentile bandwidth shown in FortiWeb Cloud might be very low, or even shown as 0. This is because there aren't enough 5-minute buckets collected to calculate a valid value. At the end of the month with more buckets generated, the value becomes more accurate.
Purchased Bandwidth	The bandwidth included in your contract.
Overage Usage	The data consumption exceeding your contracted limit.
Status	**Open**: The period is ongoing, and information collection is in progress. **Closed**: The period has ended, and informatione collection is complete.

Click on any row in this table to view a line graph illustrating usage trends for the selected month, along with the point when you reached the 95th percentile of bandwidth. These statistics can assist you in monitoring your usage habits and determining the appropriate amount of bandwidth to purchase in the future

Reports

In addition to the application-level threat data displayed on **Dashboard**, **FortiView** and **Logs** pages, you can customize weekly reports and configure FortiAppSec Cloud to send the reports to your specified email addresses reporting the threat data for all the applications in your account.

For each report entry, you can use **Add Filter** to filter out reports based on the recipients or report names. Also, you can select actions in to download the report in PDF format, generate and send the report immediately, edit the report configuration, or delete the created report. For scheduled report, you can click or to pause or restart scheduling the report.

1. Click **Create Report** in **WAF > Log & Report > Reports**.
2. Configure these settings.

Report Name	Enter a name for the weekly report.
Time Range	Select the time span of the report.
Content	Select one or multiple queries that define the chart categories in the generated report. • Top Threats by Attack Category • Top Threats by Signature IDs • Top Threats by Source IPs • Top Threats by Countries • Top Threats by URLs • Top Threats by CVE • Threats By OWASP Top 10 • Applications Traffic Summary
Applications	Define the applications that you want to generate the weekly report for or not. You can add or remove all applications once.
Schedule	• Manually: Generate the report on demand. • Once: Generate the report for only one time. • Daily: Generate the report each day. • Weekly: Generate the report each week. • Monthly: Generate the report each month.
Recipients	Specify the email addresses that will receive the weekly report. Separate multiple email addresses with ",". A maximum of 10 email addresses are supported.

3. Click **OK**.

Organization

User management for FortiAppSec Cloudis handled through FortiCloud, where you can add or delete users.

- FortiCloud IAM Users on page 364
- Organization User Management
- FortiCloud Organizational Units on page 369

FortiCloud Roles

FortiCloud supports the following roles:

- **Non-OU Account:** A FortiCloud account not part of an organization.
- **Root Account:** Can create or invite member accounts and appoint OU admins. There is no option to choose an OU or member account when logging in.

- **Member Account:**Join an organization and cannot have IAM users or permission profiles of the OU type, so they cannot manage OUs or other member accounts.
- **OU Admin:** An IAM user with the Organization type that manages specific OUs or member accounts within those OUs.

IAM User permission types

Permission scope is assigned when creating a permission profile or an IAM user. It defines the scope of access a user has in terms of asset folders or OU hierarchy.

- **Local:** Default type, limited to the selected account's asset folders.
- **Organization:** Advanced settings for assigning IAM users, user groups, and permissions to OUs and member accounts. Only IAM users with this type can be assigned as an OU admin.

> Assigning IAM users with a local type to an organization on the GSLB organization page will no longer be effective if the organization is associated with a member or root account.
>
> IAM users from the member or root account will always be able to manage resources under the account, provided their permission profile allows it.

Permission scope can be defined as Local or Organization using the Choose A Type feature. The Local type is automatically assigned to all permission profiles when OU access is not enabled. However, if a login user does have OU access enabled, the scope can be set to either the Local or Organization type. Once selected, permission scope can then be based on hierarchical OU (Organization type) or asset folder (Local type) paths in the Organization portal and Asset Management portal, respectively.

For full details on permission scope, please see Permission scope with Organizations.

For steps on how to create an IAM user, please see FortiCloud IAM Users on page 364.

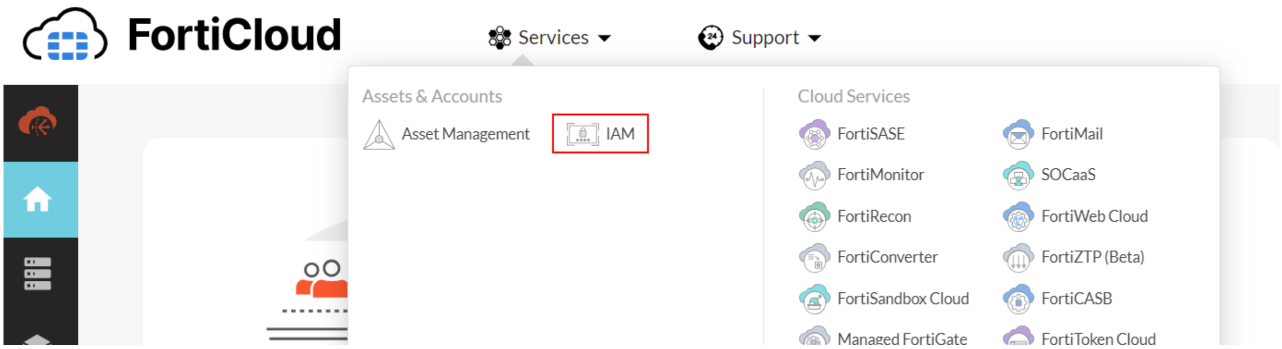
FortiCloud IAM Users

An IAM (Identity and Access Management) user with Organizational permissions has specific credentials and permissions, facilitating controlled access to FortiCloud resources and services.

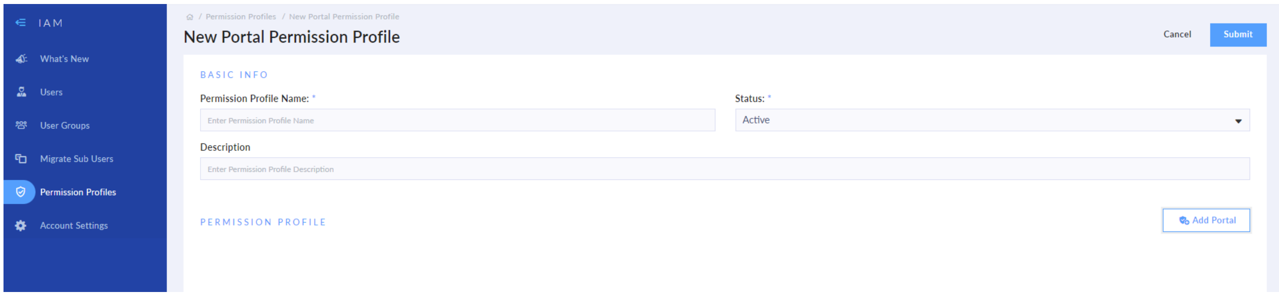
Before creating an IAM user to use with FortiAppSec Cloud, you must first create a FortiAppSec Cloud portal Permission Profile.

Create a new FortiAppSec Cloud portal permission profile

1. On the admin home page, go to **Services > Assets&Accounts > IAM** in the top navigation bar.



2. Click on **Permission Profiles** in the left-hand navigation bar.
3. Click **Add New** to create a new Permission profile.



New Portal Permission Profile

BASIC INFO

Permission Profile Name: *

Enter Permission Profile Name

Status: *

Active

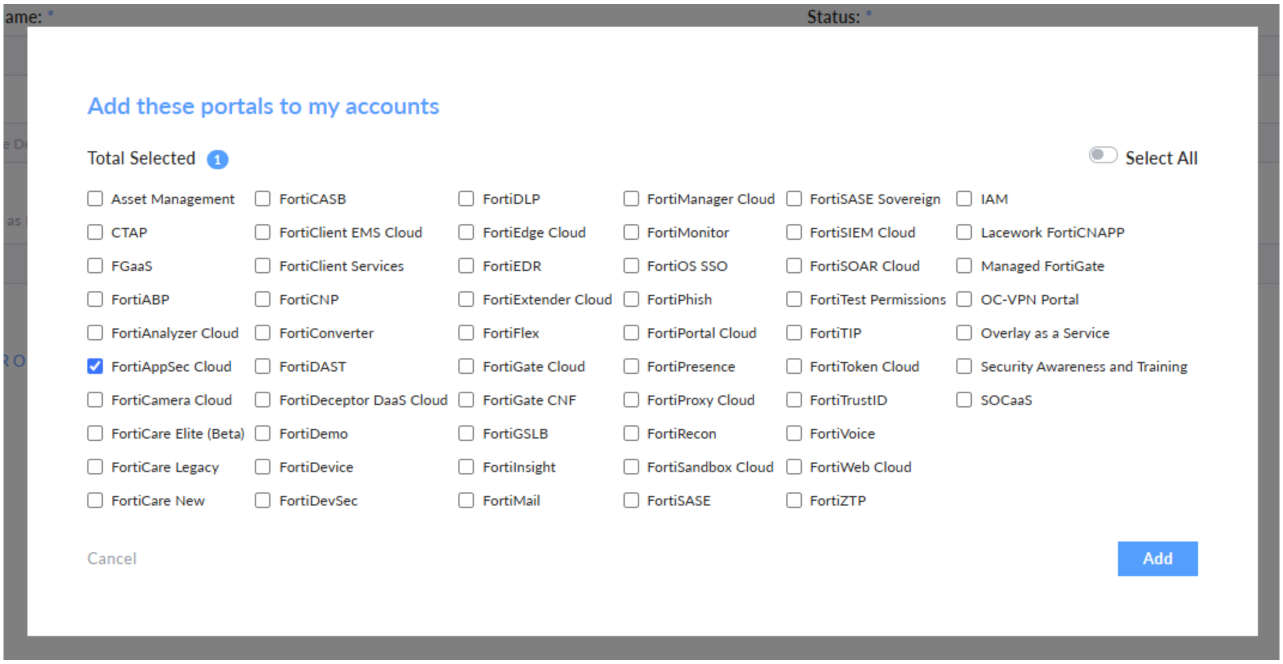
Description

Enter Permission Profile Description

PERMISSION PROFILE

   a. Enter a name for the profile in the Permission Profile Name field.
   b. Set the **Status** to **Active**.
   c. Enter a description of the portal permissions in the Description field.

4. Click **Add Portal**. A list of available portals is displayed.



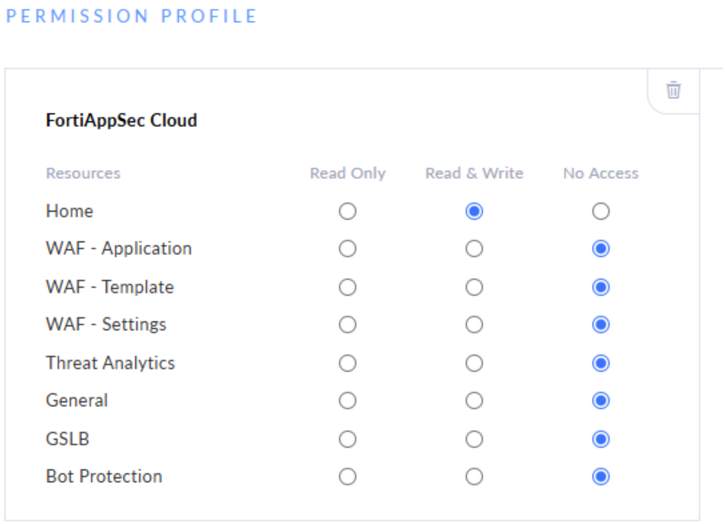
Add these portals to my accounts

Total Selected 1

□ Asset Management
□ CTAP
□ FGaaS
□ FortiABP
□ FortiAnalyzer Cloud
☑ FortiAppSec Cloud
□ FortiCamera Cloud
□ FortiCare Elite (Beta)
□ FortiCare Legacy
□ FortiCare New
□ FortiCASB
□ FortiClient EMS Cloud
□ FortiClient Services
□ FortiCNP
□ FortiConverter
□ FortiDAST
□ FortiDeceptor DaaS Cloud
□ FortiDemo
□ FortiDevice
□ FortiDevSec
□ FortiDLP
□ FortiEdge Cloud
□ FortiEDR
□ FortiExtender Cloud
□ FortiFlex
□ FortiGate Cloud
□ FortiGate CNF
□ FortiGSLB
□ FortiInsight
□ FortiMail
□ FortiManager Cloud
□ FortiMonitor
□ FortiOS SSO
□ FortiPhish
□ FortiPortal Cloud
□ FortiPresence
□ FortiProxy Cloud
□ FortiRecon
□ FortiSandbox Cloud
□ FortiSASE
□ FortiSASE Sovereign
□ FortiSIEM Cloud
□ FortiSOAR Cloud
□ FortiTest Permissions
□ FortiTIP
□ FortiToken Cloud
□ FortiTrustID
□ FortiVoice
□ FortiWeb Cloud
□ FortiZTP
□ IAM
□ Lacework FortiCNAPP
□ Managed FortiGate
□ OC-VPN Portal
□ Overlay as a Service
□ Security Awareness and Training
□ SOCaaS

5. To use this Permission Profile with FortiAppSec Cloud, select the FortiAppSec Cloud portal.
6. Click **Add**. The new FortiAppSec Cloud portal displays as a card under **Permission Profile**

- Click the switch under **Access** to enable the portal, then select your desired access settings for this profile.



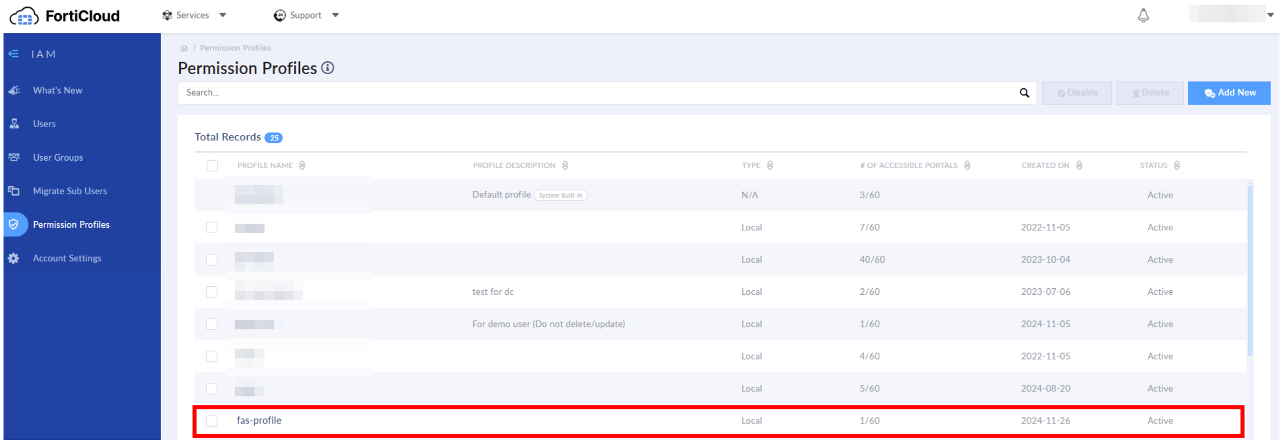
PERMISSION PROFILE

FortiAppSec Cloud

Resources	Read Only	Read & Write	No Access
Home	○	●	○
WAF - Application	○	○	●
WAF - Template	○	○	●
WAF - Settings	○	○	●
Threat Analytics	○	○	●
General	○	○	●
GSLB	○	○	●
Bot Protection	○	○	●

- For other portals with role-based permissions, enable access and specify the portal Access Type and any Additional Permissions.

7. Click **Save**. The permission profile is now available to be assigned to users.



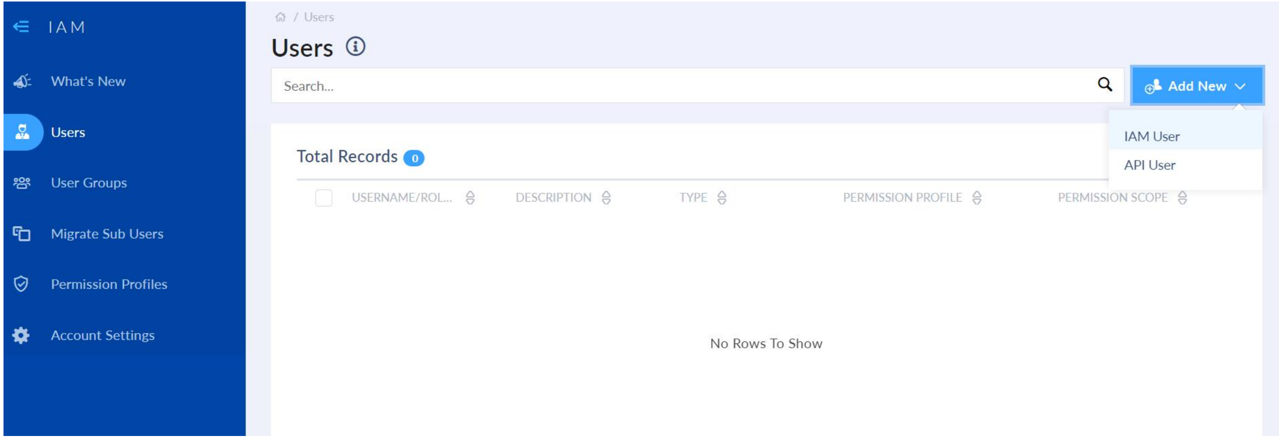
Permission Profiles

Total Records 25

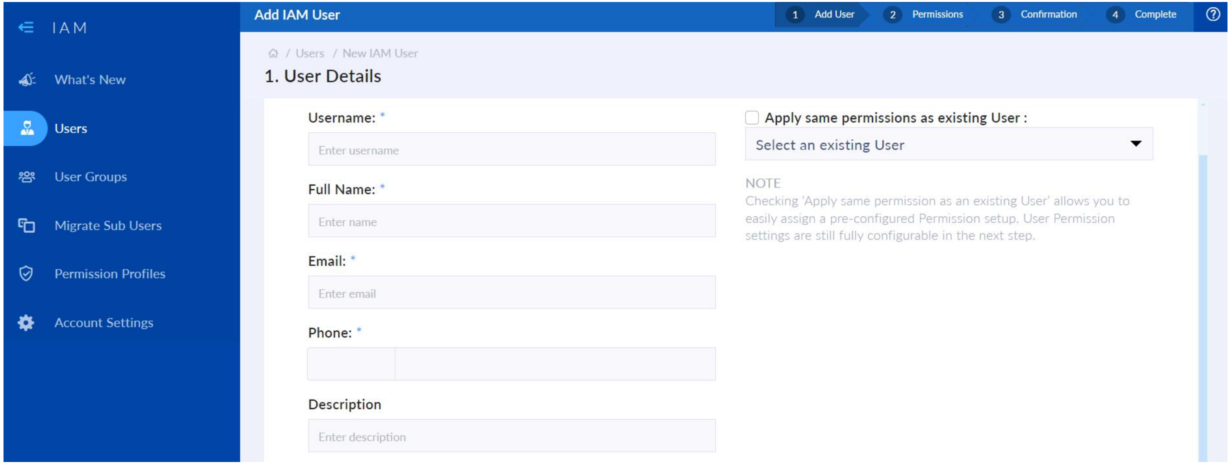
	PROFILE NAME	PROFILE DESCRIPTION	TYPE	# OF ACCESSIBLE PORTALS	CREATED ON	STATUS
	[redacted]	Default profile System Built-In	N/A	3/60		Active
□	[redacted]		Local	7/60	2022-11-05	Active
□	[redacted]		Local	40/60	2023-10-04	Active
□	[redacted]	test for dc	Local	2/60	2023-07-06	Active
□	[redacted]	For demo user (Do not delete/update)	Local	1/60	2024-11-05	Active
□	[redacted]		Local	4/60	2022-11-05	Active
□	[redacted]		Local	5/60	2024-08-20	Active
□	fas-profile		Local	1/60	2024-11-26	Active

Add an IAM User to FortiAppSec Cloud

1. Go to the **Users** page, click the **Add New** button, and click ***IAM User***.



   a. Step 1: User Details - Fill in the basic fields and click *Next*.



1. User Details

Username: *
Enter username

Full Name: *
Enter name

Email: *
Enter email

Phone: *

Description
Enter description

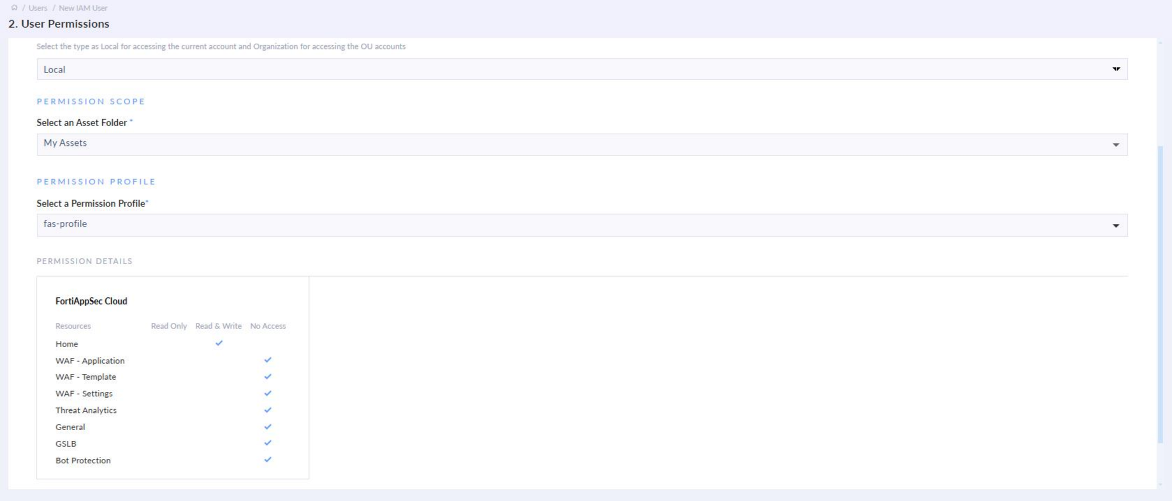
□ Apply same permissions as existing User :
Select an existing User

NOTE
Checking 'Apply same permission as an existing User' allows you to easily assign a pre-configured Permission setup. User Permission settings are still fully configurable in the next step.

   b. Step 2: User Permissions

      i. Select any Asset Folder of your choice.

      ii. Under the **Permission Profile** subsection, select a permission profile with a FortiAppSec Cloud portal. Click **Next**.



2. User Permissions

Select the type as Local for accessing the current account and Organization for accessing the OU accounts
Local

PERMISSION SCOPE

Select an Asset Folder *
My Assets

PERMISSION PROFILE

Select a Permission Profile*
fas-profile

PERMISSION DETAILS

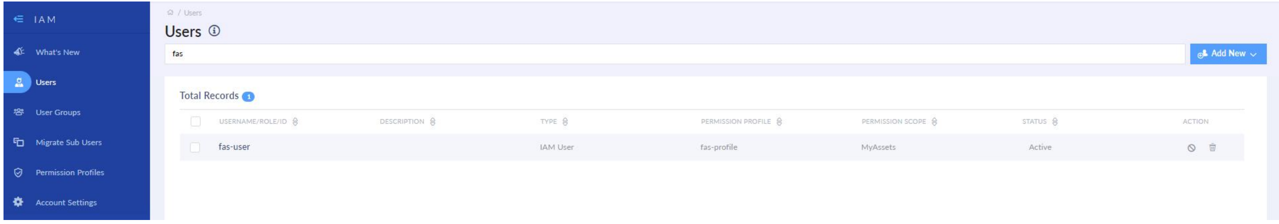
FortiAppSec Cloud

Resources	Read Only	Read & Write	No Access
Home		✓	
WAF - Application			✓
WAF - Template			✓
WAF - Settings			✓
Threat Analytics			✓
General			✓
GSLB			✓
Bot Protection			✓

c. Review the user information, and click **Confirm**. The user's details are displayed.

i. Account credentials must be shared with the user. The account password can be configured using Generate Password. See Generating Password Reset Link for instructions on how to configure the account password and share user credentials.

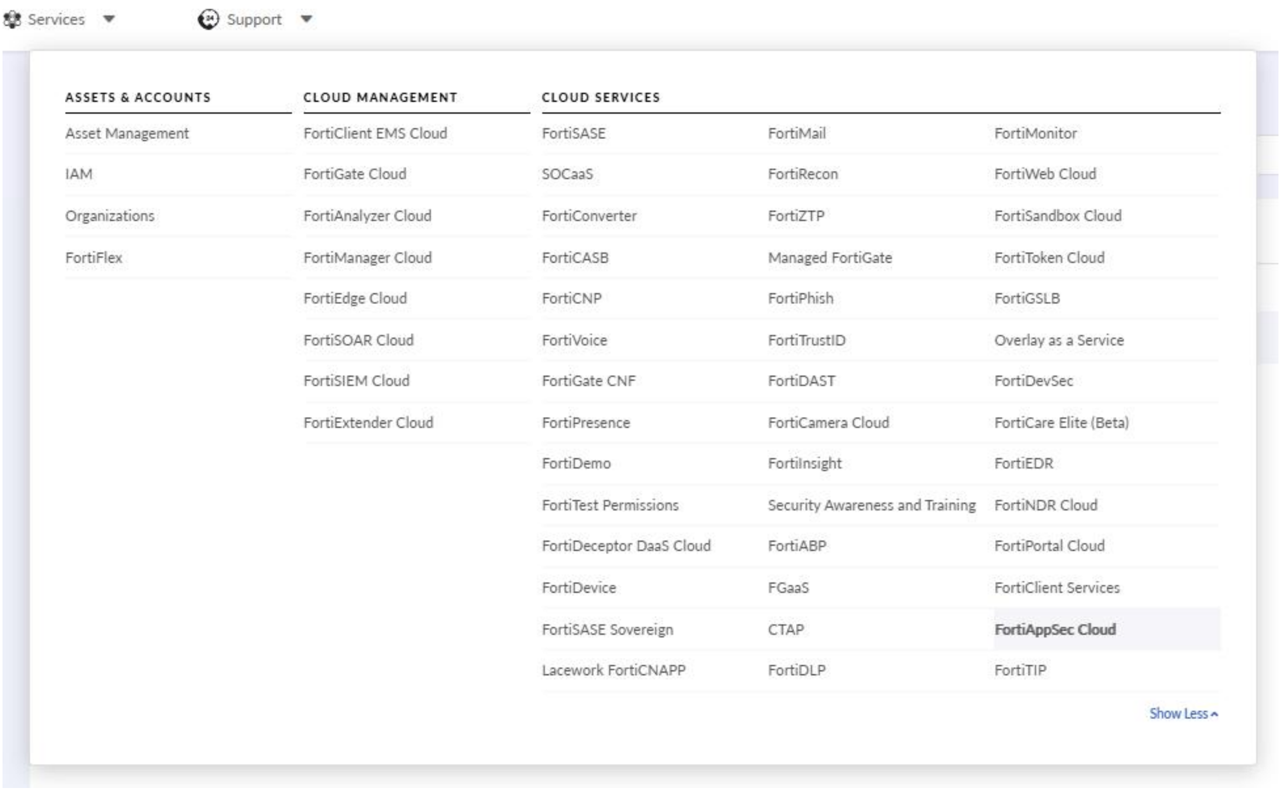
2. Return to the **IAM Users** page and find the newly added user listed.



	USERNAME/ROLE/ID	DESCRIPTION	TYPE	PERMISSION PROFILE	PERMISSION SCOPE	STATUS	ACTION
□	fas-user		IAM User	fas-profile	MyAssets	Active	

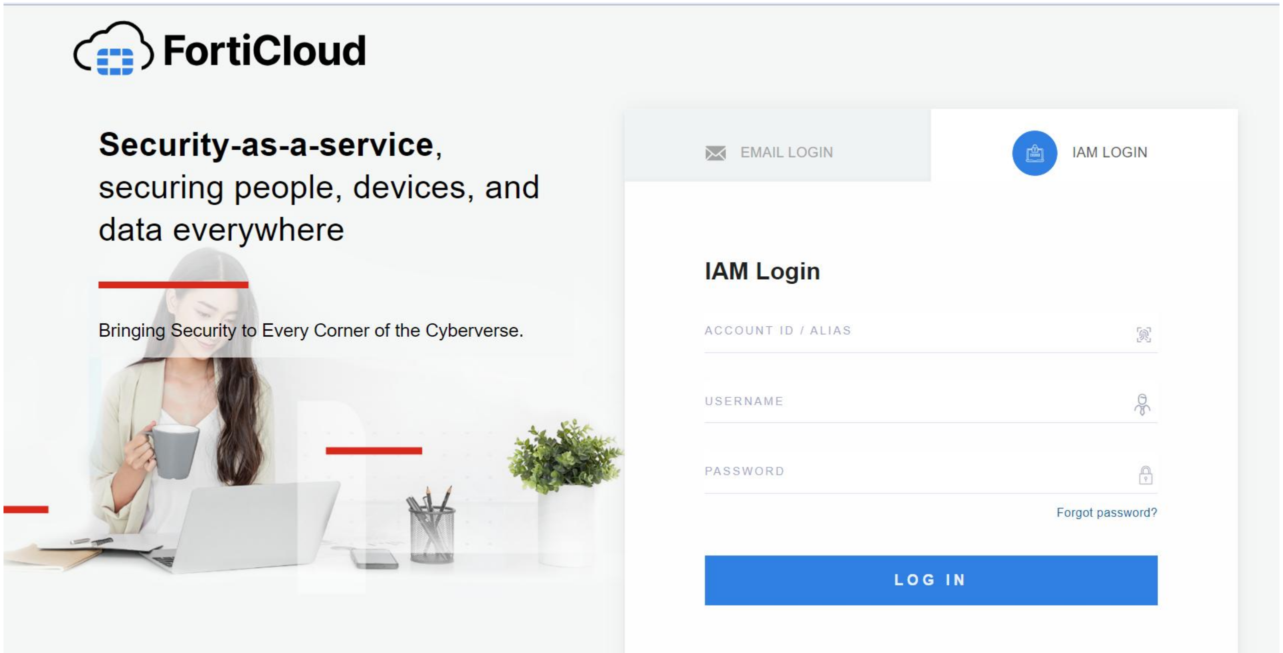
3. Navigate to the top menu bar and click **Services > FortiAppSec Cloud**. You may need to click **Show More** to access this option.

Please note, you must access FortiAppSec Cloud from here in order to see the newly added user.



ASSETS & ACCOUNTS	CLOUD MANAGEMENT	CLOUD SERVICES		
Asset Management	FortiClient EMS Cloud	FortiSASE	FortiMail	FortiMonitor
IAM	FortiGate Cloud	SOCaaS	FortiRecon	FortiWeb Cloud
Organizations	FortiAnalyzer Cloud	FortiConverter	FortiZTP	FortiSandbox Cloud
FortiFlex	FortiManager Cloud	FortiCASB	Managed FortiGate	FortiToken Cloud
	FortiEdge Cloud	FortiCNP	FortiPhish	FortiGSLB
	FortiSOAR Cloud	FortiVoice	FortiTrustID	Overlay as a Service
	FortiSIEM Cloud	FortiGate CNF	FortiDAST	FortiDevSec
	FortiExtender Cloud	FortiPresence	FortiCamera Cloud	FortiCare Elite (Beta)
		FortiDemo	FortiInsight	FortiEDR
		FortiTest Permissions	Security Awareness and Training	FortiNDR Cloud
		FortiDeceptor DaaS Cloud	FortiABP	FortiPortal Cloud
		FortiDevice	FGaaS	FortiClient Services
		FortiSASE Sovereign	CTAP	**FortiAppSec Cloud**
		Lacework FortiCNAPP	FortiDLP	FortiTIP

4. The IAM user can log in by clicking **Sign in as IAM user** on the login page.



Manage IAM users

For updated information on managing IAM users, please refer to the latest FortiCloud documentation.

FortiCloud Organizational Units

FortiAppSec Cloud supports FortiCloud Organization, enabling centralized management and control of all Fortinet SaaS solutions through FortiCloud. This centralized account management service consolidates multiple FortiCloud accounts into a structured system of Organization/Organizational Units (OUs).

How to use FortiCloud Organization

1. Turn on the Organization feature.
   a. Access the Organizational portal. Go to *My Account* > *My Account (IAM version)* > *Account Preferences* and click *Enable Organization Feature*.
2. Create Organizations.
   a. Go to https://support.fortinet.com/organization.
   b. Please refer to Creating an organization for detailed steps on creating organizations.
3. Create member accounts under Organizations.
   a. Member accounts are independent FortiCloud accounts linked to a primary account, each with its own billing, configuration, and resources. They allow different departments or business units to operate separately but remain associated with a central account.
   b. AM users and permission profiles created by a member account cannot have the OU (Organizational Unit) type. This means they cannot select OUs or manage other member accounts, even if those accounts belong to

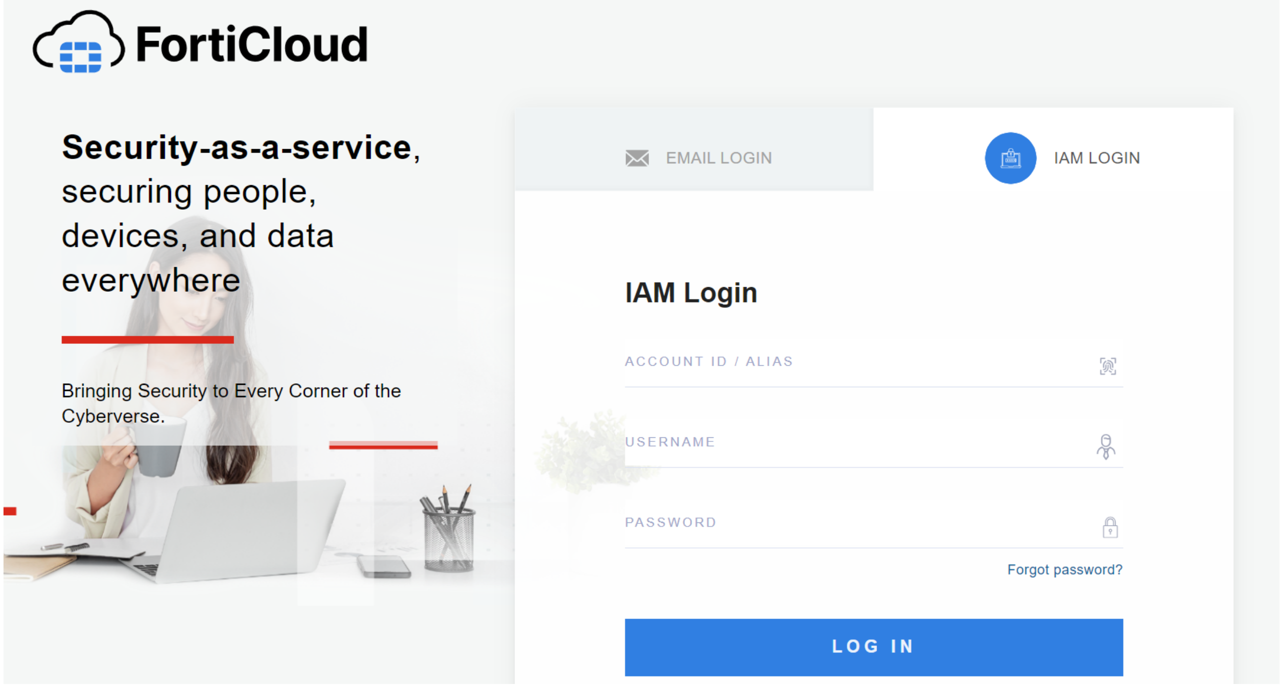
the same OU.

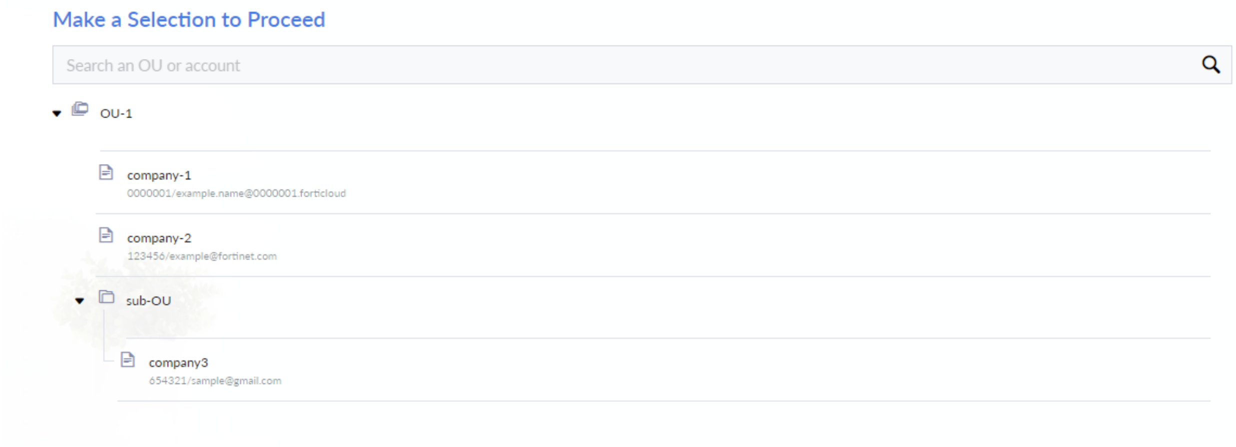
   c. Refer to Creating new member accounts for detailed steps on creating member accounts.

4. Enable and create permission profiles.
   a. Permission profiles determine the level of access granted to users. These profiles must be created before you can assign them to users and user groups.
   b. For details on the distinction between users with Local and Organization access types, see Permission scope with Organizatio
   c. Please refer to Creating a permission profile for detailed steps on creating permissions.
5. Create IAM users.
   a. IAM Users are identities created within a single FortiCloud account. The primary account manages their permissions and access to resources, providing fine-grained control over user access within the account.
   b. When creating an IAM user, you must assign them to permission profiles created in the previous step.
   c. Please refer to Creating a new IAM user for detailed steps on creating IAM users.
6. Manage users.
   - To manage IAM users' access to FortiAppSec Cloud resources under different member accounts, you can either edit an existing IAM user and set their *Type* to *Organization*, or create a new *Organization* type IAM user.
   - An IAM user with Organization type can transfer products between different OUs and register assets to member accounts. For guidance on navigating the Asset Management portal, refer to the Viewing assets in the Organization.
   - Assigning IAM users with a local type to an organization on the FortiAppSec Cloud organization page will no longer be effective if the organization is associated with a member or root account. IAM users from the member or root account will always have the ability to manage resources under the account, as long as their permission profile allows it.

Switching between organizations in FortiCloud

1. Logging into the FortiAppSec Cloud portal as an IAM user with the Organization type will lead to a selection page where you must choose an account to proceed with resource operations.


FortiCloud
Security-as-a-service, securing people, devices, and data everywhere
Bringing Security to Every Corner of the Cyberverse.
EMAIL LOGIN
IAM LOGIN
IAM Login
ACCOUNT ID / ALIAS
USERNAME
PASSWORD
Forgot password?
LOG IN



Make a Selection to Proceed

Search an OU or account

OU-1

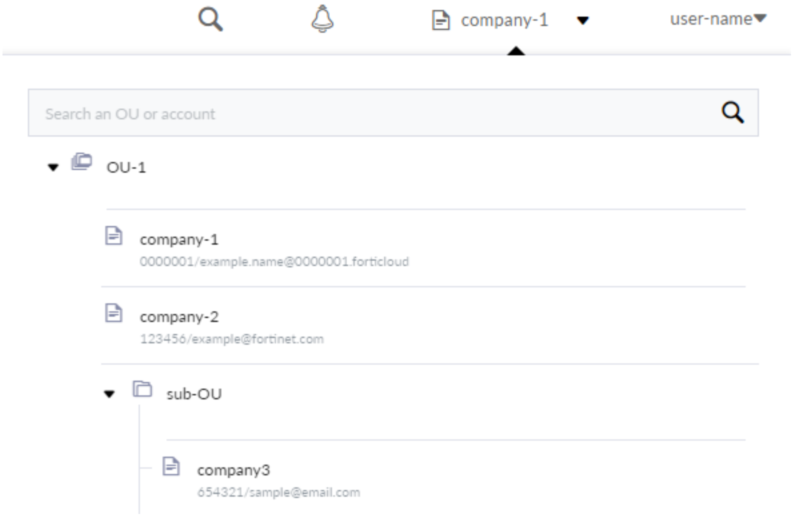
company-1
0000001/example.name@0000001.forticloud

company-2
123456/example@fortinet.com

sub-OU

company3
654321/sample@gmail.com

2. After selecting an account, you can switch accounts using the dropdown menu in the top right corner.



company-1

user-name

Search an OU or account

OU-1

company-1
0000001/example.name@0000001.forticloud

company-2
123456/example@fortinet.com

sub-OU

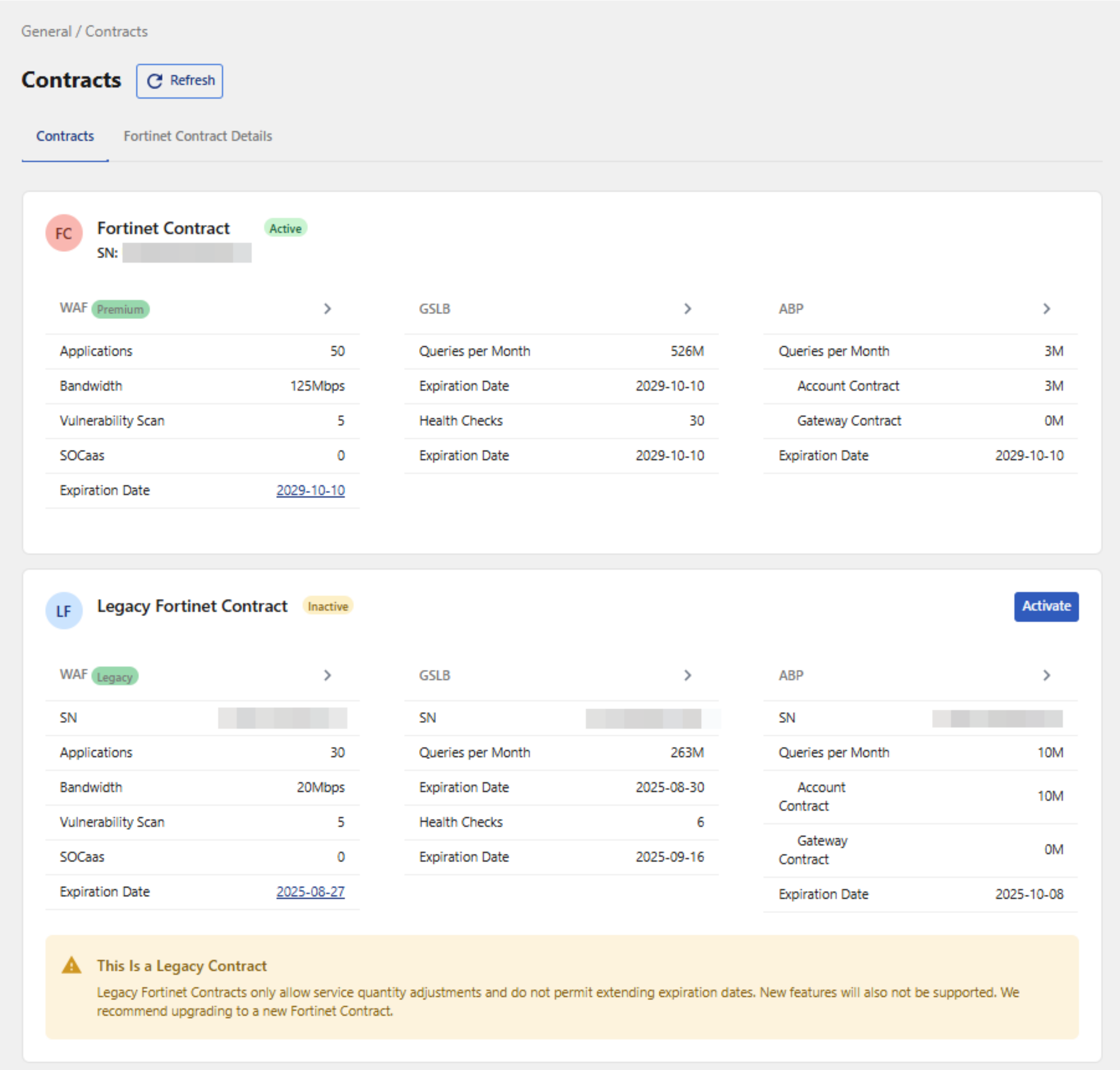
company3
654321/sample@email.com

Support

If you need assistance or have any questions about the upcoming changes, please contact your local reseller or reach out to Fortinet Support.

Registering serial number

1. Navigate to **General > Contracts**. The serial number (SN) for your service is located under the title of your active contract.



General / Contracts

Contracts Refresh

Contracts | Fortinet Contract Details

FC **Fortinet Contract** Active
SN: [redacted]

WAF Premium	
Applications	50
Bandwidth	125Mbps
Vulnerability Scan	5
SOCaas	0
Expiration Date	2029-10-10

GSLB	
Queries per Month	526M
Expiration Date	2029-10-10
Health Checks	30
Expiration Date	2029-10-10

ABP	
Queries per Month	3M
Account Contract	3M
Gateway Contract	0M
Expiration Date	2029-10-10

LF **Legacy Fortinet Contract** Inactive — Activate

WAF Legacy	
SN	[redacted]
Applications	30
Bandwidth	20Mbps
Vulnerability Scan	5
SOCaas	0
Expiration Date	2025-08-27

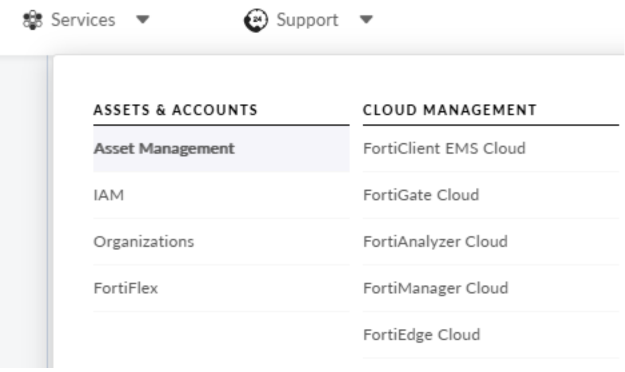
GSLB	
SN	[redacted]
Queries per Month	263M
Expiration Date	2025-08-30
Health Checks	6
Expiration Date	2025-09-16

ABP	
SN	[redacted]
Queries per Month	10M
Account Contract	10M
Gateway Contract	0M
Expiration Date	2025-10-08

⚠ **This Is a Legacy Contract**
Legacy Fortinet Contracts only allow service quantity adjustments and do not permit extending expiration dates. New features will also not be supported. We recommend upgrading to a new Fortinet Contract.

2. Go to https://support.fortinet.com, follow the guidelines provided in the FortiCloud documentation Registering Assets to register serial numbers (assets).

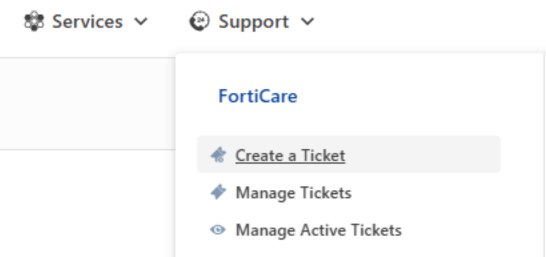
Once all of your serial numbers are registered, you can view them in FortiCloud through **Services > Asset Management > Products**.



Submitting support tickets

To submit a technical support tickets, you will be required to enter the serial number of an active license.

1. In the top navigation bar, go to **Support > Create a Ticket**.



2. Select **Technical Support Ticket**, enter the serial number of a valid license, then click **Submit Ticket**.

FAQs

This section answers frequently asked questions about FortiAppSec Cloud.

You can jump to the relevant topic areas:

General

Overview

Why migrate from FortiWeb Cloud/ FortiGSLB/ FortiGuard ABP to FortiAppSec Cloud?

FortiAppSec Cloud is Fortinet's integrated platform for application security services. It unifies four previously standalone solutions — FortiWeb Cloud (Web Application Firewall and Threat Analytics), FortiGSLB (Global Server Load Balancing), and FortiGuard Advanced Bot Protection — into a single, cohesive platform. This integration streamlines management and operations while delivering a comprehensive application security solution. FortiAppSec Cloud addresses a broad spectrum of needs, from traffic optimization and load balancing to advanced threat protection, ensuring robust and efficient security for modern applications.

How is the FortiAppSec Cloud Platform delivered?

The FortiAppSec Cloud Platform is a SaaS service accessible via https://appsec.fortinet.com.

What are the advantages of the FortiAppSec Cloud Platform?

The advantages of the new solution include:

- Unified management for web application security, advanced bot protection, threat analytics, and server load balancing.
- End-to-end protection for web applications and APIs.
- Centralized security management for hybrid cloud environments.
- Advanced delivery capabilities, including GSLB and content routing.

- Faster content delivery with a global CDN.
- Improved visibility and reduced complexity for easier application security management.

Is the FortiAppSec Cloud Platform SOC2 compliant?

The WAF and Threat Analytics services are SOC2 compliant. The GSLB and Advanced Bot Protection services are under review and are expected to pass SOC2 compliance shortly. SOC2 compliance ensures services meet rigorous security, availability, and confidentiality standards.

Are there any changes in functionality/features for existing services?

Most functionality and features remain the same between the previous standalone products and FortiAppSec Cloud. However, with FortiAppSec Cloud, we aim to highlight the evolution of the Cloud WAF industry towards a unified, all-inclusive offering that encompasses all cloud-based web application protection features.

Where can I check the status of FortiAppSec Cloud and access incident history?

Visit https://status.appsec.fortinet.com/ to check the real-time service status, review incident history, and subscribe for updates. Subscribing ensures you stay informed about any outages or changes affecting the system.

Can I access the FortiAppSec Cloud portal via API?

Yes, you can access the FortiAppSec Cloud portal through its API. This API enables you to manage configurations, automate workflows, and access application data. For more details, please refer to the FortiAppSec Cloud RESTful API Reference.

FortiAppSec contracts

What features are included in a FortiAppSec Cloud Contract, and can services be purchased separately?

The FortiAppSec Fortinet Contract is a comprehensive solution designed to enhance application security and optimize performance. The contract includes the following features:

- **Web Application Firewall (WAF)**: Requires both **website** and **bandwidth** contracts to ensure proper protection and performance. The available features vary based on Standard and Premium plans.
- **Dynamic Application Security Testing (DAST)**: Supports a defined number of **assets** for security testing.
- **Global Server Load Balancing (GSLB)**: Includes features such as **Queries Per Second (QPS)** and **health checks** to maintain server efficiency.
- **Advanced Bot Protection (ABP)**: Provides robust defenses against malicious bot activity.
- **Threat Analytics**: Delivers real-time visibility, actionable insights, and advanced reporting on application-layer security events for proactive threat detection and response.
- **Security Operations Center (SOC)**: Offers managed security monitoring and incident response services for comprehensive threat management.

What are the different WAF plans (Standard/Premium) in FortiAppSec Cloud Contracts?

There are two tiers of FortiAppSec Cloud contracts:

- **Standard**: Focuses on core protections, including negative security model policies, default configurations such as signatures, request limits, and more.
- **Premium**: Includes all features of the Standard plan and adds advanced capabilities, such as machine learning for web/API/bot protection, Threat Analytics, and additional security enhancements.

For a detailed comparison of the Standard and Premium plans, please visit the FortiAppSec Cloud Plan Comparison.

Please note that the features and usage limits of these plans are fixed and cannot be customized. For example, you cannot "mix and match" the bandwidth limit of the standard plan with the application limit of the premium plan.

Can I have multiple license types active in my account at the same time?

No, only one primary license type can be active at a time within a single account. Inactive licenses cannot be used while another license type is active.

Exception: Gateway licenses remain active regardless of which other license type is in use. This is because they provide essential services, such as traffic routing, load balancing, and secure application delivery, which are critical for maintaining uninterrupted operations. By staying active, gateway licenses ensure that core functionality continues seamlessly, even when other licenses are inactive or switched.

How do I check my current active license type?

You can check your current active license by navigating to **General > Contracts** in the FortiAppSec Cloud web portal. On this page, you will see all your contracts along with their statuses, including an indication of which license type is currently active.

If you do not see your license or encounter any issues, please contact Fortinet Support.

How do I switch from my old license to a newly purchased license?

To switch between license types, log into the FortiAppSec Cloud web management console, navigate to **General > Contracts**, select the desired license type you wish to activate, and follow the on-screen prompts to confirm the switch.

What happens when my current license expires?

When your current license expires, FortiAppSec Cloud will continue protecting your applications for 21 days.

During this 21-day grace period:

- Your applications remain protected.
- However, you cannot edit the configurations for your applications unless the contract is renewed.

After the 21-day extension:

- Your applications will be deleted from your FortiWeb Cloud account.

To avoid service interruptions and potential data loss, ensure your contract is renewed before the grace period ends. For assistance, please contact Fortinet Sales.

Will FortiFlex be supported on the new FortiAppSec Cloud?

Yes, we plan on supporting FortiAppSec Cloud FortiFlex entitlements in an upcoming release.

Will FortiAppSec Cloud be supported via the marketplace?

Yes. We plan on supporting FortiAppSec Cloud FortiFlex entitlements in an upcoming release.

How is the number of WAF sites and bandwidth calculated in FortiAppSec Cloud Contracts?

The number of WAF sites and the allocated bandwidth are determined by the specific SKU purchased. Each SKU defines the allowed number of application sites and the corresponding bandwidth allocation per seat.

For detailed contract information, refer to the FortiAppSec Cloud Ordering Guide.

How do I extend a FortiAppSec Cloud Fortinet Contract?

To extend your FortiAppSec Cloud Fortinet Contract, contact your Sales Engineer (SE) to adjust the quantity or expiration date of your existing contract instead of purchasing a new one.

If you would like to change contract types, (eg. from Standard to Premium) you may also purchase a new FortiAppSec Cloud Fortinet Contract with an effective date at the end of your current contract, rather than extending the current contract’s duration.

You will receive an email notification as your license approaches its expiration date.

How does GSLB QPS and health check work?

GSLB QPS (Queries Per Second) and health checks in FortiAppSec Cloud Contracts are managed based on the license's specifications. The GSLB QPS determines the number of queries your Global Server Load Balancing can handle per second, while health checks monitor the availability and performance of your services. These parameters are defined in your contract and are enforced to ensure optimal load balancing and service reliability.

For detailed contract information, refer to the FortiAppSec Cloud Ordering Guide.

How does the Advanced Bot Protection (ABP) quota work?

The Advanced Bot Protection (ABP) quota in FortiAppSec Cloud Contracts defines the number of bot queries your system can handle per month. This quota ensures that the ABP features are used within the licensed limits. If the quota is exceeded, additional bot traffic may be restricted unless the license allows for overuse or an upgrade is performed.

For detailed contract information, refer to the FortiAppSec Cloud Ordering Guide.

What are the SOCaaS features available?

SOCaaS (Security Operations Center as a Service) features include real-time security monitoring, event response, and threat analysis. SOCaaS helps in identifying, analyzing, and mitigating security threats to protect your applications and data, providing an added layer of security management.

For detailed contract information, refer to the FortiAppSec Cloud Ordering Guide.

How does the DAST scanning quota work?

The DAST (Dynamic Application Security Testing) scanning quota specifies the number of assets that can be scanned for vulnerabilities. This quota ensures that security testing is conducted within the licensed limits. The exact number of assets that can be scanned depends on the specific FortiAppSec Cloud Contract SKU you have purchased.

For detailed contract information, refer to the FortiAppSec Cloud Ordering Guide.

Can customers buy WAF features A-La-Carte?

No, customers can only choose between the **Standard** or **Premium** plans.

Notifications and Communication

Will I be notified before my license or contract expires?

Yes, the FortiAppSec Cloud system will send notifications to inform you before your license or contract expires. These notifications serve as reminders to renew or switch to a different contract to avoid service interruptions.

How will I be notified about service impacts when switching licenses?

Service impacts due to license switches will be communicated through confirmation dialogs in the management console. These dialogs will display specific warnings related to the potential effects on your services, ensuring you are aware of any disruptions before confirming the change.

What notifications will I receive about quota usage and limitations?

You will receive notifications when you approach or exceed your quota limits for various services such as bandwidth, GSLB QPS or ABP queries. These alerts help you manage your resource usage effectively and consider upgrading your license if necessary.

How can I track my resource usage and receive alerts?

Resource usage can be tracked through the **Usage** page in the management console, where usage reports are available. Additionally, you can set up alerts to notify you when your usage approaches predefined thresholds, enabling proactive management of your resources.

Why am I not receiving notification emails from FortiAppSec Cloud even after subscribing to email notifications?

Please ensure that emails from FortiAppSec Cloud are white-listed and not filtered as spam. You will not be able to receive any emails from FortiAppSec Cloud if the address is blocked by the firewall. If FortiAppSec Cloud emails are filtered as spam, then the email notifications would not arrive in the email inbox and may be in the "Spam" folder.

Miscellaneous

What is Two-Factor Authentication used for?

FortiAppSec Cloud offers Two-Factor Authentication to secure your FortiAppSec Cloud account by an additional security token generated by Virtual MFA Devices. See Two-Factor Authentication.sent through email or the FortiToken Mobile application. See Two-Factor Authentication.

What are the supported web browsers?

FortiAppSec Cloud supports the following web browsers:

- Mozilla Firefox version 59 or higher
- Google Chrome version 65 or higher

Who should I contact for assistance?

- **Technical Support:** For configuration issues, troubleshooting, or technical queries, reach out to Fortinet Support through the Fortinet Support Portal.
- **Sales Team:** For inquiries about upgrades, licensing, or contract modifications, contact Fortinet Sales.

How do I view the serial number of my license?

You can find the serial number of your FortiAppSec Cloud license by logging into the web portal and navigating to **General > Contracts**.

If the serial number (SN) has already been registered, you can also find it in FortiCloud under **Asset > Manage/ View Products**.

For instructions on registering serial numbers, please see Registering Assets.

WAF FAQ

Application Onboarding

What is a FortiAppSec Cloud application, and how many domains does a WAF application support?

In FortiAppSec Cloud, an application can include:

- A primary declared domain name.
- Up to 9 additional domain names that belong to the same root domain and point to the same origin server(s).

For example,

- Domains such as "example.com" and "test.example.com" can be part of the same application "example.com."
- However, "test.com" would be considered a different application because it does not share the same root domain.

This structure ensures that all domains within an application share consistent security and origin configurations.

How do I onboard WAF applications?

For instructions on onboarding WAF applications, please see Onboarding WAF applications on page 19.

What are the recommended actions after an application is onboarded?

It's suggested to perform the following actions after an application is onboarded:

Required actions

- Change the DNS record at your DNS service using the CNAME IP address provided by FortiAppSec Cloud.
- Configure your origin servers to only accept traffic from FortiAppSec Cloud IP addresses. See this article for a list of FortiAppSec Cloud IP addresses.
- Configure security rules and observe the attack logs in FortiView Threat View or Attack Logs. If legitimate traffic is falsely detected as attacks, add exceptions or modify the security rules to avoid false positives in the future. See Attack logs for how to add exceptions.
- Enable **Block Mode** in **WAF > Applications** if you have continuously observed the attack logs for several days and there aren't any false positives recorded in the logs.

Optional actions

- Whitelist FortiAppSec Cloud IP addresses to make sure access from FortiAppSec Cloud to your web application is uninterrupted. See this article for a list of FortiAppSec Cloud IP addresses.

What is an application in FortiAppSec Cloud?

In FortiAppSec Cloud, an application is a declared domain name and up to 9 other domain names attaching to it, which all belong to the same root domain and all point to the same origin server(s). For example, "example.com" and "test.example.com" can be part of the same application "example.com", while "test.com" is a different application.

What is a CNAME?

A CNAME record is a part of the DNS zone records (that may or may not be present) that is used to essentially redirect from one URL to another. The CNAME record for a DNS zone will have a URL for the record NAME, it will be of record TYPE “CNAME”, and it will have a VALUE of another URL. The VALUE field of a CNAME record is often called the CNAME, or canonical (true) name.

When you complete onboarding an application, FortiAppSec Cloud provides you with a CNAME. You need to go to your DNS service and pair this CNAME with your application's domain name.

What if my DNS service does not support CNAMEs?

If your DNS service does not support CNAME, the workaround is to pair your application's domain name with the IP addresses of the FortiAppSec Cloud scrubbing center which is deployed in the same region with your origin server. See this article for a list of FortiAppSec Cloud IP addresses.

Please note the CDN feature won't be available in this scenario because all the traffic will be forwarded to a fixed scrubbing center.

Which public cloud regions host FortiAppSec Cloud scrubbing centers?

FortiAppSec Cloud supports most of the regions on AWS, Azure, and Google Cloud. See this article for a detailed list of supported regions.

What is a CDN?

By enabling **CDN**, the data on your origin servers can be cached in FortiAppSec Cloud scrubbing centers distributed around the world. When users request data from your application, they can be directed to the nearest scrubbing center and rendered with the requested data. See this article for a list of FortiAppSec Cloud IP addresses.

You can enable CDN when onboarding an application, or set this option in the **Application Settings** dialog (**WAF > Applications**).

Network

What public cloud regions are currently supported?

For a complete list of supported regions, please see Restricting direct traffic & allowing FortiAppSec Cloud IP addresses on page 26.

How do I request support for additional Public Cloud regions?

Please contact your local sales engineer for the latest roadmap on adding additional regions.

Can one account protect applications in multiple regions?

Yes, the WAF module allows each application to be assigned a region during onboarding, so customers are not restricted to a single region. Additionally, the GSLB module enables load balancing across multiple locations and regions.

Can FortiAppSec Cloud WAF protect applications that are not hosted on a public cloud?

Yes, FortiAppSec Cloud WAF is not limited to applications hosted on a specific public cloud.

Can FortiAppSec Cloud WAF protect applications that are hosted on non-standard ports?

Yes, predefined non-standard ports are available for selection during the onboarding process. If you need support for a different port, please contact support.

Can FortiAppSec Cloud WAF protect multiple web applications on the same account?

Yes, please review License & Contract on page 10 for information on usage limits for different license options.

Does FortiAppSec Cloud WAF offer a Content Delivery Network (CDN) service?

Yes, you can enable Global CDN at no additional cost. For more details, please refer to the CDN on page 38 section.

When using the WAF service for my application, what do I need to implement outside of the FortiAppSec Cloud web portal?

To implement the WAF service's WAF service, please make the following changes outside of the FortiAppSec Cloud platform:

- **DNS Update:** Modify the DNS entry of your web application to point to FortiAppSec Cloud WAF.
- **Traffic Forwarding Configuration:** Configure FortiAppSec Cloud with the original web application IP to forward traffic accordingly.
- **Client Traffic Flow:** With this setup, traffic from clients will first reach FortiAppSec Cloud and then be forwarded to your web application.

FortiAppSec Cloud WAF's onboarding wizard will guide you through these steps for seamless implementation.

How can I add applications running on non-standard port?

FortiAppSec Cloud by default uses port 80 for HTTP protocol and 443 for HTTPS protocol. Non-standard ports are also available. You can select them when you onboard applications. Please note if non-standard port is selected for HTTPS, you will not be allowed to configure HTTPS redirection.

If you need to use different ports, please contact FortiAppSec Cloud Support or your sales engineer for further help. Notice not all non-standard ports can be used, and HTTP and HTTPS services must use different ports.

When onboarding an application, do all domains need to be part of the same root domain?

Yes, all the domains should belong to the same root domain, such as www.example.com and mail.example.com.

After the application is onboarded, you can go to **Network > Endpoints** to change or add domains, but you are not allowed to change the first domain in the list. Highly recommend to use root domain as the first domain.

Up to how many origin servers can I add for one application?

You can add at most 128 origin servers to the server pool of an application.

What is an Automatic Certificate?

WAF automatically obtains an SSL certificate on your behalf from Let’s Encrypt within two minutes of the DNS CNAMEA record change. It will be used in HTTPS connections to encrypt or decrypt the traffic. If FortiAppSec Cloud fails to obtain the certificate, it will try again 12 minutes later.

Thirty days before your certificate expires, WAF verifies again that your DNS CNAMEA record is still correct. If it is, FortiAppSec Cloud renews your certificate for another 90 days, so it never expires. For more information, see Automatic Certificate on page 63.

What do I need to pay attention to if I use automatic certificates?

FortiAppSec Cloud WAF automatically retrieves SSL certificates from the Certificate Authority Let's Encrypt. See Automatic Certificate for the things you should pay attention to if automatic certificate is used.

What’s a Certification Authority Authorization (CAA) record and do I need to use it? How does it affect automatic certificate?

DNS Certification Authority Authorization (CAA) is an Internet security policy mechanism which allows domain name holders to indicate to certificate authorities whether they are authorized to issue digital certificates for a particular domain name. It does this by means of a new "CAA" Domain Name System (DNS) resource record.

If you have configured a CAA record at your DNS service and want to use automatic certificate in FortiAppSec Cloud, make sure to add "letsencrypt.org" in the CAA value. This allows Let's Encrypt to issue certificates for your domain name.

What TLS versions are supported?

FortiAppSec Cloud supports TLS 1.1, 1.2, and 1.3.

What do I need to check if I still see “connection is not secure” in my browser?

Check the following if “connection is not secure” displays in the browser when users visit your application:

- If HTTP protocol is used in this connection, it's suggested to enable **HTTPS** service and **Redirect all HTTP traffic to HTTPS** in **Network > Endpoints** in FortiAppSec Cloud WAF, so that the HTTP access can be redirected to HTTPS, which is secured by SSL/TSL certificates.
- If HTTPS protocol is used in this connection, check whether the certificates are valid:
  - If **Custom Certificate** is selected in **Network > Endpoints**, make sure the SNI certificates or intermediate certificates you imported are valid.
  - If **Automatic Certificate** is selected, see the following FAQs to trouble-shoot:
    - What do I need to pay attention to if I use automatic certificates? on page 382
    - What’s a Certification Authority Authorization (CAA) record and do I need to use it? How does it affect automatic certificate? on page 382

How to check network connectivity when traffic does not go through?

To troubleshoot network connectivity when traffic doesn't go through, follow these steps:

1. Ensure that you are using a supported web browser. FortiAppSec Cloud WAF supports Mozilla Firefox version 59 or higher, and Google Chrome version 65 or higher. While other browsers may also display well but we cannot guarantee compatibility.
2. Check the error message displayed. If it shows server connectivity issue, perform either one of the following actions:
   a. Modify the local host file on your computer to map your application's domain name to the IP address of the origin server. Then, enter the domain name of your application in the browser to verify the traffic can go through when FortiAppSec Cloud WAF is bypassed.
   b. If there are more than one origin servers, FortiAppSec Cloud WAF performs health check and displays the server status in the **Server Status** widget on **Dashboard** page, as well as in the **Server Status** column of the **Origin Server** page. Make sure the **Health Check** option is turned on and the **URL Path** on the **Origin Server** page is configured correctly, as FortiAppSec Cloud relies on it to verify server responsiveness.
   If the origin server is accessible, proceed to the following steps to identify the specific configuration on FortiAppSec Cloud causing the error.
   If the origin server is not accessible, it suggests that the connectivity issue is unrelated to FortiAppSec Cloud WAF and you should troubleshoot the origin server.
3. Verify the **SSL Encryption Level** configuration on the **Origin Server** page and ensure that your origin server supports the specified SSL Encryption Level.
4. Disable **HTTP/2** on the **Origin Server** page and check if the traffic goes through. If it does, it indicates that your origin server doesn't support HTTP/2, and therefore, the HTTP/2 option on FortiAppSec Cloud WAF should be disabled.
5. Analyze attack logs in **Threat Analytics > Attack Logs** to identify any WAF modules that may be blocking traffic.

How to get notified if an origin server fails?

FortiAppSec Cloud WAF supports sending logs to your syslog or ElasticSearch server to notify the origin server status change.

1. Enable **Health Check** for the origin server in the Load Balancing rule in **Network > Origin Server**. Please note this setting is only available when the **Server Balance** is turned on.
2. Refer to Audit logs for instructions on exporting logs to your syslog server.

How can I use FortiAppSec Cloud WAF with AWS ALB/ELB?

When using FortiAppSec Cloud WAF, the client's requests from the Internet are forwarded to WAF first before they reach the ALB/ELB.

When you onboard an application, for **Origin Server** settings in **Step 2- Network**, select **Customize**, then enter the ALB/ELB's domain name in **IP Address or FQDN**. Make sure to enter the domain name, not the IP address.

I entered a dynamic domain name for my origin server's address in Network Settings. How frequently does the WAF service update the IP address paired with this domain name?

In the DNS record that pairs the dynamic domain name and IP address, you will find a TTL (Time to Live) value. The WAF service updates the IP address according to this TTL value. If the TTL indicates the IP address expires, WAF will resolve the domain name to obtain the latest IP address.

The IP addresses of my origin servers keep changing. How can I configure FortiAppSec Cloud to automatically obtain the latest IP addresses?

You can use **Cloud Connectors** to obtain the IP addresses if your origin servers are deployed on AWS, Azure, or GCP.

1. Create a Cloud Connector to authorize FortiAppSec Cloud WAF to access the resources in your public cloud account. See Cloud Connectors on page 156.
2. In **Network > Origin Servers**, select **Dynamic** for **Server Type**, then configure **Cloud Connector** and **Filter** as instructed in Origin Servers on page 68.

How should I configure the network settings if my application offers different content through HTTP and HTTPS?

See Network settings for applications serving different content over HTTP and HTTPS on page 168 for more information.

How can I get notified of newly added WAF IP addresses?

- Check the inbox of your account email. Search for keywords "new WAF cluster" from "noreply@appsec.fortinet.com".
- Check out the What's New on page 8.
- Use the following APIs to retrieve the IP lists:
  - IPv4: https://appsec.fortinet.com/ips-v4
  - IPv6: https://appsec.fortinet.com/ips-v6

You can find the full list of WAF IP addresses at Restricting direct traffic & allowing FortiAppSec Cloud IP addresses on page 26.

Usage

How does WAF calculate bandwidth?

FortiAppSec Cloud measures each account using a burstable model for overall account bandwidth calculation. The model is based on calculating the 95th percentile of bandwidth usage of clean traffic and is also common with other CDNs and Cloud solutions.

The 95th percentile bandwidth is calculated in the following way:

- Traffic for the entire month is measured in 5 minute buckets.
- At the end of the month, the 5% of buckets with the most Mbps are dropped, and the highest Mbps rate of the remaining buckets represents the 95th percentile value for the account.

At the beginning of every month, the 95th percentile bandwidth shown in FortiAppSec Cloud might be very low, or even shown as 0. This is because there aren't enough 5-minute buckets collected to calculate a valid value. At the end of the month with more buckets generated, the value becomes more accurate.

ABP FAQ

This section answers frequently asked questions about ABP.

You can jump to the relevant topic areas:

- Onboarding on page 385
- Integration (deployment mode) on page 385
- Security and Resilience
- Miscellaneous on page 386

Onboarding

This section answers frequently asked questions about the ABP onboarding.

How do I onboard an application onto Advanced Bot Protection?

Onboarding an application onto Advanced Bot Protection is a straightforward process.

Here are the basic steps you should follow:

1. **Install the License**: Install the license (standalone) and verify the connector of FortiADC or FortiWeb is enabled.
2. **Access FortiAppSec Cloud**: login to appsec.fortinet.com and navigate to **Advanced Bot Protection**.
3. **Create an application**: Locate your dashboard's **Add New Application** option.
4. **Integration**: ABP is currently only deployed through integration with FortiADC and FortiWeb. For integrated deployment, follow the integration instructions with FortiADC and FortiWeb.
5. **Monitoring**: Once the application is onboarded and protected, use the FortiAppSec Cloud dashboard to monitor traffic and security incidents. You can set up alerts and notifications for suspicious activities.

The onboarding process is also detailed in this user guide, Onboarding an ABP Application on page 204.

Integration (deployment mode)

This section answers frequently asked questions about the ABP integration (deployment mode).

What are the deployment options for Advanced Bot Protection?

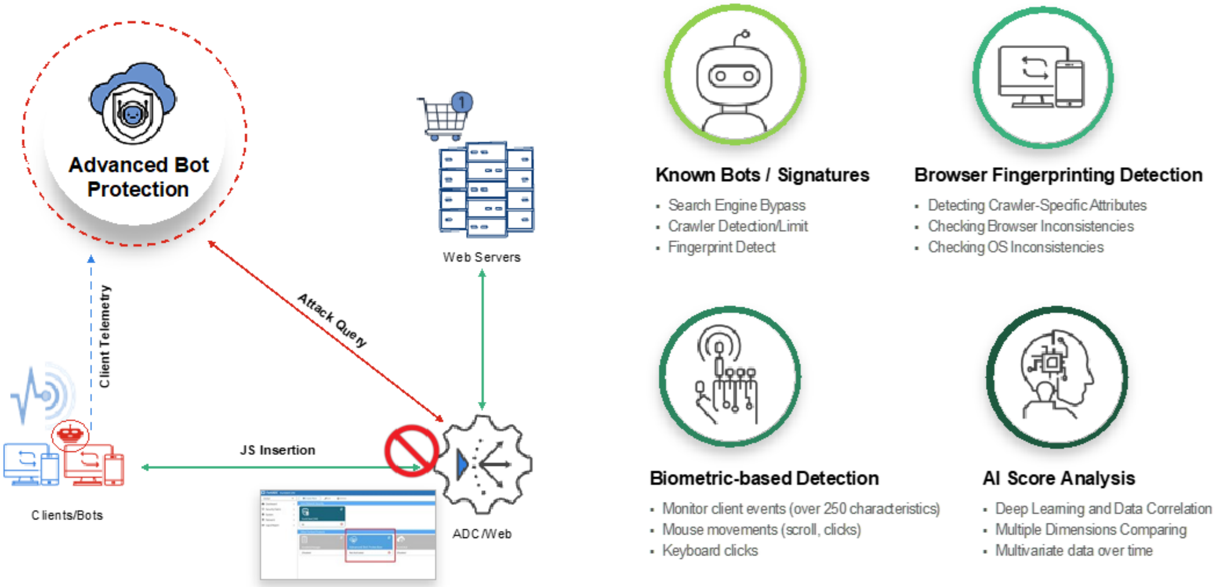
FortiAppSec Cloud requires injecting JavaScript into the client’s session to collect data. Two options are available:

A. Standalone Deployment (coming soon): You can deploy Advanced Bot Protection as a standalone solution. In this mode, you will need to install a snipped code on the web application for browser JS insertion. This mode operates only in monitoring (visibility) mode and cannot enforce or block bots.

B. Integrated Deployment with FortiADC and FortiWeb: Alternatively, you can integrate Advanced Bot Protection with FortiADC and FortiWeb, two leading products in the Fortinet ecosystem. This integrated solution enhances your overall security posture by combining the advanced bot protection capabilities of Advanced Bot Protection with the robust application delivery and web application firewall capabilities of FortiADC and FortiWeb.

How does the integration work?

1. The client reaches the web application via the FortiADC/FortiWeb (acting as a Reverse Proxy).
2. FortiADC/FortiWeb returns an HTTP/S response to the client with JavaScript insertion (via) for telemetric information.
3. The client and the FortiADC/FortiWeb (via fabric connector) communicate with the Advanced Bot Protection Cloud for data telemetry info (headers, device fingerprinting, and more).
4. Advanced Bot Protection inspects the request to determine if the client – is human or a bot.
5. Based on the result of the analysis, Advanced Bot Protection analyzes the request and sends an instruction back to FortiADC/FortiWeb (block, CAPTCHA, allow).


Advanced Bot Protection
Web Servers
Attack Query
Client Telemetry
JS Insertion
Clients/Bots
ADC/Web
Known Bots / Signatures
• Search Engine Bypass
• Crawler Detection/Limit
• Fingerprint Detect
Browser Fingerprinting Detection
• Detecting Crawler-Specific Attributes
• Checking Browser Inconsistencies
• Checking OS Inconsistencies
Biometric-based Detection
• Monitor client events (over 250 characteristics)
• Mouse movements (scroll, clicks)
• Keyboard clicks
AI Score Analysis
• Deep Learning and Data Correlation
• Multiple Dimensions Comparing
• Multivariate data over time

Does Advanced Bot Protection charge for blocked attacks?

No. The FortiAppSec Cloud provides attack information to the FortiADC and FortiWeb, which blocks access to the application and stops the threats.

Miscellaneous

This section answers frequently asked questions about ABP that are not covered in other FAQ topics.

Does Advanced Bot Protection offer real-time reporting and analytics?

Yes, FortiAppSec Cloud's ABP provides real-time reporting and analytics dashboards, allowing you to monitor traffic, bot activity, and security incidents, helping you make informed decisions to enhance your bot protection strategy.

GSLB FAQ

Refer to the following Frequently Asked Questions for any questions or issues you may have. If they do not address your concern, please contact our support team for assistance and we will respond to your request as soon as possible.

- GSLB and DNS Services on page 387
- Health check on page 389
- One-click GSLB on page 390
- Fabric connectors FAQ
- Synthetic testing on page 392
- DevOps on page 391
- Other on page 393

GSLB and DNS Services

How long does it take to get the expected DNS response after creating a new FQDN or Zone?

Normally it takes between 30 seconds to several minutes to get the correct DNS response after a new FQDN or Zone is created.

How do you link GSLB to a DNS service?

Create a Zone with the same domain as the GSLB service. The A/AAAA records of the GSLB service should appear in the DNS service resource records list automatically.

How long does it take for a modification in DNS configuration (like zone A record Rdata) to take effect?

The DNS configuration should be active within a few minutes.

How long does it take for the IP to update after the status of one of GSLB service’s pool members changes?

It depends on the pool member health check parameters, including down/up retry, interval and timeout. The smaller the value is, the less time it takes for the IP to update. The approximate time it takes is: retry * interval + timeout + system_run_time (in a few seconds).

Why isn't the GSLB service or DNS service working? How do I troubleshoot?

For the GSLB service, first check the status on the GSLB services page and make sure the virtual server in the pool is up. If the status is up or if there is a DNS service resource record, check the Contact & License page and confirm that there are valid query licenses and that the number of used queries is smaller than total queries.

Alternatively, you can check the DNS response status directly. If it is REFUSED, most likely the user does not have valid personal licenses or the maximum capacity has been reached or the domain does not exist. If there is a NOERROR status with NS server information in the authority section, this means it can find that domain and record, but the virtual servers in pool are not available. If the status is NXDOMAIN with SOA record in authority section, it means the domain name exists but the record's hostname doesn't exist.

What's the difference between FQDN configure DNS-Query-Origin and Virtual Server Pool GEO?

Both methods match DNS queries based on client's DNS Server IP location.

DNS-Query-Origin method in FQDN uses location list to do the matching and can select multiple locations into the list. It only matches the region that is selected in location list.

GEO method in virtual server pool uses the virtual server's data center region to respond to the DNS query geographically. This method matches the DNS query location with the data center's region if they are in same region, country or continent.

What are the meanings of the special Regions?

Reserved: IP addresses that are not assigned (e.g. 10.0.0.0/24)

Anonymous Proxy: IP addresses that are defined as anonymous proxy in GeoIP-DB (e.g. 46.19.137.0/24)

Satellite Provider: IP addresses that are defined as satellite provider in GeoIP-DB (e.g. 57.72.6.0/24)

Other Country: Reserved for further use, and no IP address are assigned to this region

Asia/Pacific Region: IP addresses that are defined as Asia/Pacific Region in GeoIP-DB, but not belonging to any specified Asian countries

Europe Region: IP addresses that are defined as Europe in GeoIP-DB, but not belonging to any specified European countries

What are the meanings of the special Locations?

Any: Any client IP GEO location

How does GSLB GEO work?

Assume that the user uses DNS-Query-Origin method in GSLB services and wants to perform load balancing according to DNS query source IP. The work flow is as follows:

1. Client sends DNS query to the local DNS server
2. The local DNS server functions as a resolver to ask who knows the IP for this DNS query.
3. After doing recursion from root server, the query is sent to GSLB with the local DNS server's source IP address. GSLB will respond with a best matched IP according to the DNS query source IP (local DNS server's IP) location and send a DNS response to the client's local DNS server.
4. Then, the local DNS server will send a DNS response to the client.

What is the expected result if the source IP matches both the address group and location or one of the address groups or location when the DNS-Query-Origin virtual server pool selection method is selected in GSLB Services?

GSLB will respond to the DNS query based on its source IP according to the address group and location parameter configured in the VSP.

If the source IP matches both the address group and location of one VSP, GSLB will respond to the DNS query with the VS IP from this VSP.

If the source IP matches multiple VSP's address group or location, GSLB will respond to the DNS query with the VS IP from the address group that matches the VSP first, and then the location (as the address group matched VSP has priority over the location matched VSP).

If the source IP matches one VSP's address group or location, GSLB will respond to the DNS query with the VS IP from that VSP.

If the source IP matches no VSP's address group or location, GSLB will respond to the DNS query by weight for all VSP.

What if the DNS query source IP matches multiple Virtual Server Pool's address group?

GSLB will respond to the DNS query with the first matched VSP when multiple Virtual Server Pool's address groups are matched. You can reorder the VSP if you want the second matched VSP to be used to respond.

Health check

How does the health check function of Global Server Load Balance (GSLB) work?

GSLB checks the virtual server availability of backend servers by performing health checks. It sends out various probes according to the configuration and checks the response to determine the status of the virtual server. Virtual servers that respond successfully for the configured number of times are considered healthy and its IP address will be included in the DNS response. Virtual servers that fail to respond successfully for a certain number of times are determined to be unhealthy and its IP address will be not in the DNS query results.

How long does it take to get the virtual server status after initiating a health check on a virtual server?

Normally it takes no more than 1 minute for a newly configured health check to activate. After that, the time needed to get the result of the virtual server status is dependant on the health check configuration details including “Interval”, “Timeout”, “Up Retry” and “Down Retry”. For example, if the “Down Retry” value is 2 and the “Interval” value is 5 and the virtual server fails to respond, it will take about 10 seconds for the virtual server status to update to the down status. It will take about 0 to 5 seconds for the system to process the status so after the configuration is active, it will take about 15 seconds to get the virtual server status back.

Why are there default health checks?

The default health checks are configured for general usage and best practice. In the majority of cases, the default health checks can satisfy the user's need and additional health check are not needed.

Why is the health check result healthy even though the server is down?

There are several possibilities for this. If the health check is newly applied to the virtual server, it needs some time to activate and wait for the probe response before it can change the virtual server's status to down. If the number of active health checks exceeds the license limit, some of the health checks will stop probing.

Why is the health check result unhealthy even though the server is running normally?

The best way to find out why the health check is down is by capturing packages. In most of cases, the health check is down because there is no response to the probe packages. If there are return packages for DNS, HTTP and HTTPS health checks, you will need to check whether the content of the response is consistent with the configuration. For example, for the DNS health check, you will need to check whether the returned host IP address is same with the configuration.

How can I shorten the health check time and show the latest status more quickly?

There are four default health checks with parameter: interval 30, timeout 10, 1 time up retry, and 3 times down retry. These defaults cannot be changed. However, users can self-define health checks with shorter interval/timeout and retry times to decrease the health check time and see the status change quickly.

Does GSLB support IPv6 for health check?

No. GSLB does not currently support IPv6 type health check.

One-click GSLB

Some of my FortiADC virtual servers are not synced to GSLB. Why is this happening?

This may be due to a network issue. Disable/enable GSLB on FortiADC to make FortiADC attempt to do a full sync again. The full sync can be only performed once every 10 minutes. That means if the full sync fails, you will not be able to try again for 10 minutes. If you disable/enable the GSLB on FortiADC multiple times within 10 minutes, only one full sync will be performed.

Why is my FortiADC showing "Connecting URL Error"?

First, make sure your URL is typed correctly. Second, try to ping the URL from your FortiADC and check your FortiADC DNS server setting. Third, check the FortiADC license connected to the FortiCare account. Lastly, log into your GSLB with that account and verify that you have the correct license. Then disable/enable the GSLB on FortiADC.

How long does it take for FortiADC to do a full configure sync with GSLB?

It depends on the number of virtual servers you have enabled GSLB on your FortiADC device and the number of GSLB The more there is to configure, the longer it will take. Generally the process will take less than 10 minutes.

What should I set for the interval?

The interval value is used by FortiADC to update virtual servers’ status and statistics to GSLB. The default setting is 15, which should fit in most cases. The general idea is that the more virtual servers you have, the bigger interval you should set. For more than 500 virtual servers, 30 is an adequate number.

How long does it take for my DNS to reflect the changes in virtual server status and statistics?

It depends on the interval you set. It usually does not take longer than the time interval + 10 seconds.

How long does it take for my DNS to reflect the changes in my virtual server configurations?

It depends on the FQDN and Zone configuration you have for the account on GSLB. Usually it should take no more than 1 minute.

What should I do if the status of GSLB on FortiADC displays ‘Connected’ but I can’t get the DNS to respond?

First, check if your virtual servers are fully synced with GSLB. Search for the virtual server in the GSLB related server. If it is not there, then try to do the full sync again on FortiADC, and check your system event log on FortiADC. Second, check if the related GSLB service was automatically created. Search for the virtual server-related GSLB service by the virtual server’s host name and domain name. If it is not there, then try to do the full sync again on FortiADC, and check your system event log on FortiADC.

DevOps

What are the source IP addresses from FortiAppSec Cloud GSLB?

Please allow access to your application from the host “sourceaddress.fortigslb.com” if you have health checks or Fortigate connectors configured.

Note: The IP Addresses under this host are subject to change. You can get the latest IP addresses using the dig/nslookup tool. For example:

```
; <<>> dig 9.10.3-P4-Ubuntu <<>> @8.8.8.8 sourceaddress.fortigslb.com.
; (1 server found) ;; global options: +cmd
;; Got answer: ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 33288
;; flags: qr rd ra; QUERY: 1, ANSWER: 8, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;sourceaddress.fortigslb.com. IN A

;; ANSWER SECTION:
sourceaddress.fortigslb.com. 300 IN A 54.203.242.250
sourceaddress.fortigslb.com. 300 IN A 35.86.175.134
sourceaddress.fortigslb.com. 300 IN A 35.84.144.76
sourceaddress.fortigslb.com. 300 IN A 35.163.141.12
sourceaddress.fortigslb.com. 300 IN A 54.191.103.220
sourceaddress.fortigslb.com. 300 IN A 35.80.7.29
sourceaddress.fortigslb.com. 300 IN A 18.237.202.90
sourceaddress.fortigslb.com. 300 IN A 54.245.173.230

;; Query time: 50 msec
;; SERVER: 8.8.8.8#53(8.8.8.8)
;; WHEN: Wed Nov 03 15:56:49 PDT 2021
;; MSG SIZE rcvd: 184
```

Synthetic testing

Why is the HTTP health check result unhealthy even though I can get HTTP responses from the application?

There are many possible reasons why the HTTP health check result is unhealthy. In most cases, the health check is unhealthy because the HTTP health check configuration is not consistent with the HTTP request or response. The HTTP health check by default uses HTTP GET method (i.e. No Connection). For this kind of HTTP health check, you will need to check whether below configurations are consistent with the HTTP request and response:

1. The “Sending String” field contains the correct url that matches the request url
2. If you use the “HTTP HEAD” method, the health check is successful if the status code returned in response matches the code in “Status Code” field. Therefore, you will need to check whether the code in “Status Code” is expected. Typically, you use status code 200 (OK). Other status codes indicate errors.
3. If you use the “HTTP Get” method, the health check result is determined by the “Match Type” option and its associated fields “Receive String” and/or “Status Code”.
    a. In the case of “Match String” option, the health check is successful if the string specified “Receive String” can be found in the HTTP response. So you will need to check whether the string specified in “Receive String” exists in the response returned by application.
    b. In the case of “Match Status” option, the health check is successful if the status code returned in response matches the code in “Status Code” field. Therefore, you will need to check whether the code in “Status Code” is correct.
    c. If “Match all” option is chosen, the health check is successful when the status code matches the “Status Code” field, while the string specified “Receive String” can be found in the HTTP response. Thus you will need to check both of the fields are consistent with response.

Why is the DNS health check result unhealthy even though I can get DNS responses from the application?

If the DNS reply is as expected while the health check is unhealthy, in many cases, it is due to the misconfiguration on DNS health check. You will need to check whether the “Domain Name” in DNS health check is correct, and the IP address in “Host address” field matches the host IP address returned in DNS response.

Other

How do you switch accounts for One-Click devices?

1. Disable the **GSLB** function on the One-Click device.
2. Log into FortiAppSec Cloud and navigate to **GSLB > Service > FQDN**.
3. Delete the GSLB FQDNs that were generated by this One-Click device.
4. Upload the license for the One-Click device that belongs to the new account. Check the One-Click device's license to confirm that the account information has changed.
5. Enable the one-click device GSLB function, and wait for the information to sync to the new account.

How do you move one domain from one account to another?

To move the domain example.com from account A to account B, do the following:

1. Delete the example.com domain in account A
2. Log out of account A and log into account B
3. Create the example.com domain in account B

Note: To prevent duplicate domains, you will not be able to create the domain directly in account B without deleting it from account A.

How does FortiADC HA cluster work with GSLB?

Only the config source role in your HA cluster will sync the virtual server configuration and status to GSLB. You will see the connectivity status on the GSLB page for your config source device and the message "Please Check HA Configure Primary Server" on your other device. When your config source device is turned down and your other device takes the config source role, then the new config source device will sync the virtual server configuration and status to GSLB. You will see the cloud status changed to "connected" and the assigned DNS server IP in this device. Your old config source device will show the status as "OFFLINE" on GSLB portal server page. As long as your cluster config source device is connected with GSLB, the DNS request should be answered correctly.

Threat Analytics FAQ

This section answers frequently asked questions about Threat Analytics.

- Onboarding on page 393
- Log Management on page 394

Onboarding

This section answers frequently asked questions about the Threat Analytics onboarding process.

Where is the onboarding process for Threat Analytics?

The WAF and Threat Analytics services share an onboarding process. For details on WAF onboarding, please refer to Onboarding WAF applications on page 19

Log Management

How long are the logs kept in FortiAppSec Cloud?

FortiAppSec Cloud saves the attack logs for two months and the audit logs for three months. After that, they will be deleted.

Where to view and delete the exceptions related with Anomaly Detection?

Exceptions are added in Attack Logs. It can't be reversed once being added.

If you believe that the Anomaly Detection model is inaccurate with certain exceptions, you have the option to access the TreeView page of the Anomaly Detection module. From there, you can locate the parameter to which the exception is applied and rebuild the model specifically for that parameter. When the new model is rebuilt, the exceptions added to the Anomaly Detection attack logs corresponding to that parameter will be cleared.

Why do I find several attack logs even though there is only one attack request?

In the scanning process, when a request passes through different modules in sequence, the configured action for certain modules can be set to "Alert" or "Monitor". In this case, if an attack is detected by a module with such an action, it will allow the request to continue to the next module for further scanning. However, an attack log will be generated by the module that identified the attack.

As the request progresses through subsequent modules, it is possible for the attack to be logged multiple times by different preceding modules before it is blocked by a module with a different action, such as "Block Period" or "Deny".

For more information, please refer to Sequence of scans on page 185.

Why is there no attack log while the request is blocked?

If the action of a corresponding security feature is configured as "Deny (no log)", FortiAppSec Cloud will actively deny the request and prevent it from proceeding further, but it will not generate a log entry specifically for that blocked request.

If you need to have detailed logs for auditing or analysis purposes, you may consider using a different action, such as "Deny" or "Block Period", which will not only block the request but also generate a log entry.

Domain name cannot be seen in GEO IP attack logs. How to solve it?

If the `https_host` in GEO IP attack logs shows `none`, it can be solved by enabling **Use X-Header to Identify Original Clients' IP** and **Add X-Forwarded-For** in the **Rewriting Requests** module.

How to show the client source IP instead of FortiAppSec Cloud IP received from the server side?

To observe the client's original source IP, it is advised to enable the **Rewriting Requests** module, turning on **X-Forwarded-For**, **X-Real-IP**, and **Use X-Header to Identify Original Clients' IP** options.

Why the origin server receives logs with FortiAppSec Cloud's IP rather than the client real IP even if X-Forwarded-For related options are enabled?

Logs are sent from FortiAppSec Cloud to the origin server, so the `IP:` header (layer 3) of the logs is supposed to be FortiAppSec Cloud's IP address. This is expected behavior.

To check the client real IP, you need to find it in the `X-Forwarded-For`: or `X-Real-IP:` header in the packets forwarded from FortiAppSec Cloud to your server. Be aware that to record the client real IP it's required to enable both **Add X-Forwarded-For** and **Use X-Header to Identify Original Client's IP** in the **Rewriting Requests** module.

Why an attack log is classified as Anomaly Detection, not Known Attack?

The signatures used in Known Attacks are primarily designed to detect known patterns of malicious code. However, they may not cover all variants or newly emerging forms of attacks.

In cases where an attack is logged under the Anomaly Detection threat type instead of being matched with a signature, it in fact indicates the successful functioning of the machine learning model in Anomaly Detection. It effectively screened out unknown or new variant attacks that do not align with existing signatures.

Why is the number of blocked requests in the Attack Log and the Blocked Requests Widget inconsistent?

You can view the blocked requests in three places: 1) Attack Logs; 2) FortiView Threat View ; 3) Blocked Requests widget on Dashboard. The ways they count the blocked requests are slightly different.

- To prevent Information Leakage, FortiAppSec Cloud may cloak the error pages or erase sensitive HTTP headers in response packets. Such item are logged only once per minute in Attack Logs and FortiView Threat View for you to know the Information Leakage rule took effect. In the meanwhile, the actual count is recorded in Blocked Requests Widget.
- If you have set FortiAppSec Cloud to block attacks but do not generate a log when certain violation occurs, such as Deny(no log), then the attacks will not be logged in Attack Logs and FortiView Threat View , but will be counted in the Blocked Requests widget.
- The invalid requests to the host header HOST will be blocked without generating any log.
- When the Block Mode is in disabled state, attacks won't be blocked but logs are generated.

Migration

This section covers the most frequently asked questions regarding migration from legacy services FortiWeb Cloud, FortiGSLB, and FortiGuard ABP. For information on key updates and contract change information, please see Migrating from preceding Fortinet services on page 397.

- General Information on page 395
- API transition on page 396
- Legacy Contract Management on page 396

General Information

What happens to the existing portal? Where do new/existing customers login?

At launch, all pre-existing and new customers will use FortiAppSec Cloud. The old FortiWeb Cloud/ FortiGSLB/ FortiGuard ABP portals will be deactivated, and their domains will redirect to FortiAppSec Cloud

API transition

Can I access the FortiAppSec Cloud portal via API?

Yes, API access is available. For configuration details, please see the API documentation.

Is the API for FortiAppSec Cloud different from the legacy service API?

Yes, the API for FortiAppSec Cloud introduces some changes compared to the legacy APIs for WAF (previously FortiWeb Cloud) and GSLB (previously FortiGSLB). However, the primary update is in the **API paths**, while other changes are minimal.

Key differences:

- **New Endpoint**: The API endpoint has been updated to api.appsec.fortinet.com.
- **Path Updates**: The structure of API paths has been revised, making it necessary to adjust API calls accordingly.
- **Minor Adjustments**: Other changes, such as parameters and properties, are minimal and should not require significant rework.

For a detailed list of path changes and migration steps, refer to the FortiAppSec Cloud RESTful API Reference - Changes Section.

Legacy Contract Management

What features are included in my Legacy Contract?

Legacy Contracts continue to provide the features included before the launch of FortiAppSec Cloud. However, while these existing functionalities remain available, access to new features and enhancements introduced in the FortiAppSec Cloud system is not guaranteed under Legacy Contracts.

To ensure access to the latest features, consider transitioning to a FortiAppSec Cloud contract. For more information, please contact Fortinet Sales.

Why is my contract status displayed as Legacy?

Your contract displays as **Legacy** if it uses an older license type that predates FortiAppSec Cloud, such as one inherited from the previous FortiWeb Cloud, FortiGSLB, or FortiGuard ABP. This indicates that the contract is based on the older system and may not support all the features available in FortiAppSec Cloud Contracts.

Can a contract with Legacy status be converted to a FortiAppSec Cloud Contract?

No, Legacy contracts cannot be directly converted to FortiAppSec Cloud Contracts. If you wish to transition to a FortiAppSec Cloud Contract, please contact Fortinet Sales.

Can Legacy contracts be modified to add websites or increase bandwidth?

Yes, you can modify existing legacy contracts by adding more websites or increasing bandwidth. However, extending the contract duration is not supported.

Upon the expiration of a legacy contract, customers are required to transition to FortiAppSec Cloud contracts. To ensure a seamless transition, we recommend reviewing the available FortiAppSec Cloud contract options in advance. For more details or assistance, please contact Fortinet Sales.

Will legacy FortiFlex entitlements work after the FortiAppSec Cloud launch?

Yes, existing entitlements will work. However, once FortiFlex support is launched, new entitlements will only be FortiAppSec Cloud entitlements.

What should I do if my Legacy Contract is about to expire?

If your Legacy Contract is approaching its expiry date, we recommend purchasing a new FortiAppSec Cloud Contract to ensure uninterrupted service.

Please contact Fortinet Sales to initiate the purchase of a FortiAppSec Cloud Contract.

What happens to my existing services when switching from a Legacy Contract?

- **If you purchase a FortiAppSec Cloud Premium Contract:** Your existing services will not be affected.
- **If you purchase a FortiAppSec Cloud Standard Contract:** Only the features supported by the Standard plan will remain available. Features that were supported exclusively under the Premium plan will no longer be available.

Ensure that the contract you choose aligns with your service requirements to avoid any unintended service disruptions.

Migrating from preceding Fortinet services

FortiAppSec Cloud combines services from the former FortiWeb Cloud, Advanced Bot Protection, and FortiGSLB.

- FortiAppSec Cloud key updates on page 397
- Migration Changes on page 398
- Contract Migration on page 398

FortiAppSec Cloud key updates

The following features are new to FortiAppSec Cloud and were not available in previous services:

- **New Homepage:** A redesigned homepage allowing users to view the status and health of all services in one place.
- **New Domain:** The new domain for your web application protection services is now appsec.fortinet.com. Please use this new domain to access your services, as the previous domains will be retired.

WAF and Threat Analytics (previously FortiWeb Cloud)

- **Permissions Management:** The user permissions system has been upgraded, providing more flexible configuration options.

GSLB (previously FortiGSLB)

- **Topology Page:** A new page that displays the relationships between your configured objects, giving you a clearer view of your configuration flow.
- **Permissions Management:** The user permissions system has been upgraded, providing more flexible configuration options.
- **Contract Sharing Mode:** Enable Contract Sharing mode to allow all accounts within an organization to utilize the root account's contracts.

ABP (previously FortiGuard ABP)

- **FortiCloud Organization:** Integrate your ABP service with FortiCloud Organization, enabling centralized management and control of all Fortinet SaaS solutions.
- **Contract Sharing Mode:** Enable Contract Sharing mode to allow all accounts within an organization to utilize the root account's contracts.

Migration Changes

Your applications and logs will be automatically transferred to the new FortiAppSec Cloud backend; however, please make the following adjustments:

FortiWeb Cloud

- **API Change:** The API endpoint will change to api.appsec.fortinet.com, and the URL structure will be updated accordingly. If you have not already, please update your applications or API calls to use the new endpoint.
- **Terraform Changes:** Please update your Terraform modules to ensure compatibility with the new version.
- **FAZ Requirements:** Please verify that the new version meets FortiAnalyzer compatibility requirements.

FortiGSLB

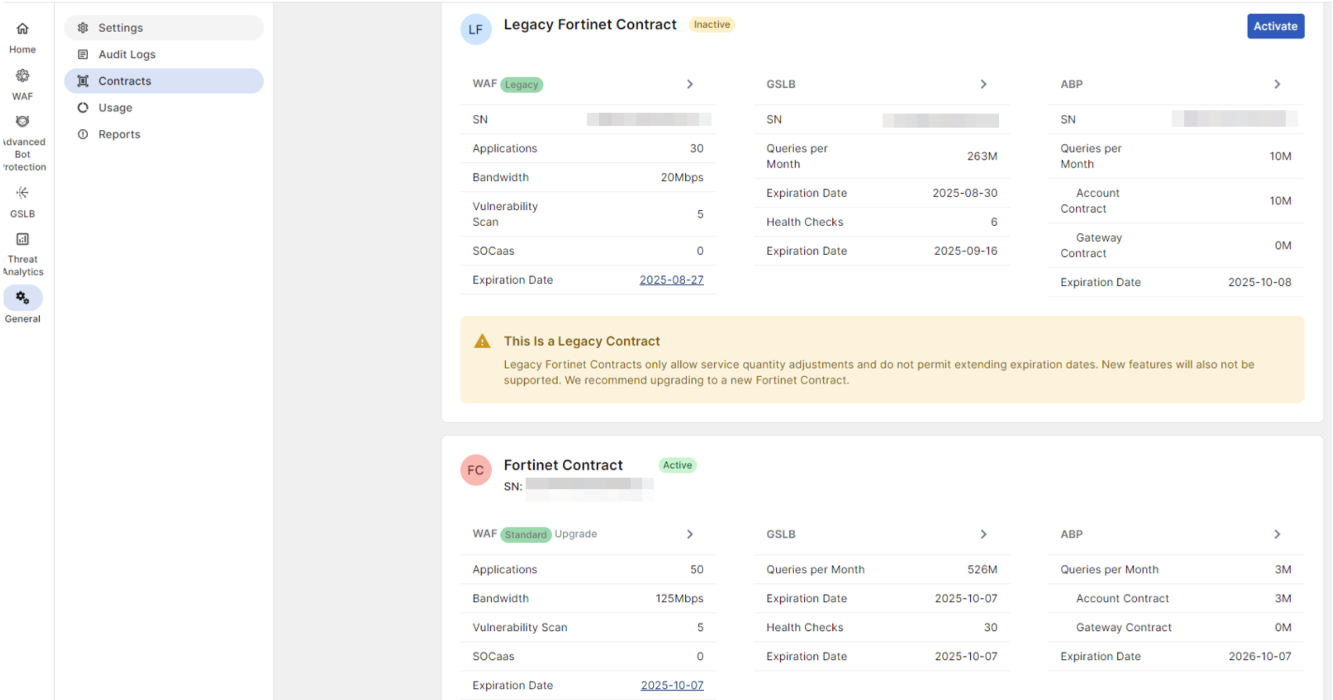
- **API Change:** The API endpoint will change to api.appsec.fortinet.com, and the URL structure will be updated accordingly. If you have not already, please update your applications or API calls to use the new endpoint.
- **Complete Organization Migration:** Please complete migrating Organizations to FortiCloud before the launch date to ensure a smooth transition into the upgraded service.

FortiGuard ABP

- **Review Permission Profiles:** After the launch, please go to the IAM portal and review the newly created permission profiles for FortiAppSec Cloud Application Security to ensure all permissions are correct and aligned with your operational needs.

Contract Migration

When FortiAppSec Cloud launched on December 1, your existing contract(s) for FortiWeb Cloud, FortiGuard Advanced Bot Protection, and FortiGSLB were transferred to FortiAppSec Cloud in the backend as **Legacy Contracts**. Legacy contracts will grant access to FortiAppSec Cloud until it expires, but contract adjustments and access to new features will not be included.



LF Legacy Fortinet Contract Inactive

Activate

WAF Legacy	
SN	[redacted]
Applications	30
Bandwidth	20Mbps
Vulnerability Scan	5
SOCaas	0
Expiration Date	2025-08-27

GSLB	
SN	[redacted]
Queries per Month	263M
Expiration Date	2025-08-30
Health Checks	6
Expiration Date	2025-09-16

ABP	
SN	[redacted]
Queries per Month	10M
Account Contract	10M
Gateway Contract	0M
Expiration Date	2025-10-08

This Is a Legacy Contract

Legacy Fortinet Contracts only allow service quantity adjustments and do not permit extending expiration dates. New features will also not be supported. We recommend upgrading to a new Fortinet Contract.

FC Fortinet Contract Active

SN: [redacted]

WAF Standard Upgrade	
Applications	50
Bandwidth	125Mbps
Vulnerability Scan	5
SOCaas	0
Expiration Date	2025-10-07

GSLB	
Queries per Month	526M
Expiration Date	2025-10-07
Health Checks	30
Expiration Date	2025-10-07

ABP	
Queries per Month	3M
Account Contract	3M
Gateway Contract	0M
Expiration Date	2026-10-07

Upgrading to a FortiAppSec Cloud contract

1. Purchase a FortiAppSec Cloud contract by contacting Fortinet Sales.
2. After purchasing the new contract, please log into your FortiAppSec Cloud portal and navigate to **General > Contracts**.

   Only one contract can be active at a time. Before activating your new contract, your legacy contract will remain active.
3. Click **Activate** in the new contract to activate it.

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