Virtual Firewall Appliance

User Guide

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VMware and Hyper-V Configuration

Follow the steps below to deploy your WAF firewall cluster in VMware (vCenter) or Microsoft Hyper-V and configure your DNS. You'll need to funnel traffic through the WAF cluster by changing your DNS.

Once you complete these steps, we'll start monitoring your web application for security violations. Also your WAF cluster will start making outbound connections to the Qualys Cloud Platform for regular health checks - these confirm the cluster is properly configured and has the latest software.

Tell me the steps

1) Download the OVA image (VMware) or the VHD image (Hyper-V). You'll get the image when you add a new WAF appliance (go to WAF Appliances > WAF Clusters, click the New WAF Appliance button).

2) Import the image in your virtualization platform. The OVA image supports VMware for production (and can be used in VirtualBox for test purposes only), while the VHD image supports Microsoft Hyper-V.

3) Set up the virtual appliance using the CLI (Command Line Interface).

4) Verify the registration of the appliance.

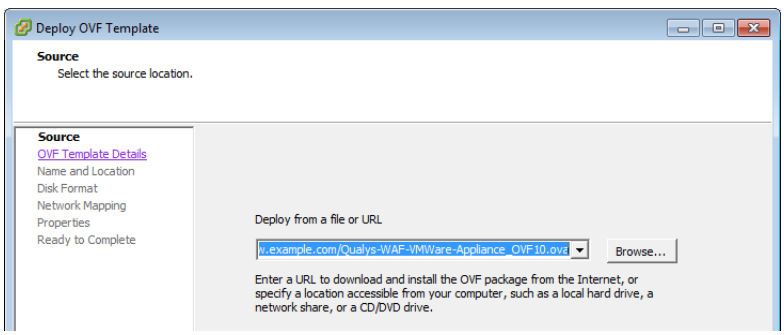
5) Test availability of your web application through Qualys WAF. Once confirmed, you'll need to alias DNS entries to direct traffic at your origin infrastructure.

Import and Register your WAF Appliance

Using vCenter

Start your VMware Client.

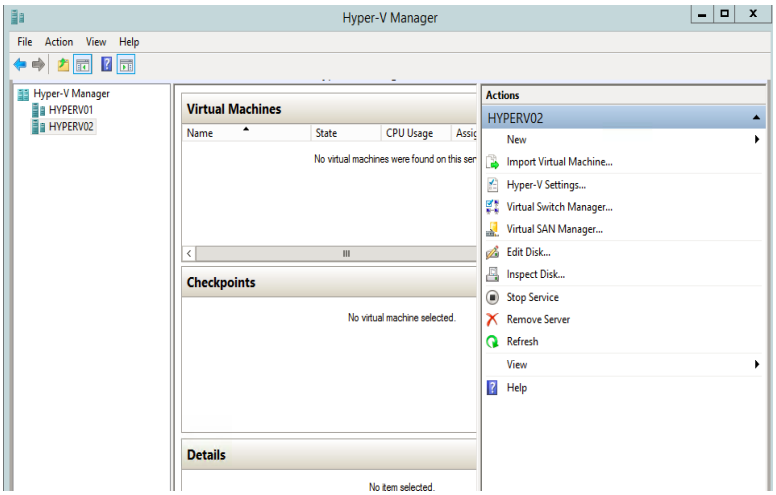
Choose "Deploy OVA File". This starts the OVA Template wizard. Browse to the downloaded OVA and select it (or enter the URL where the OVA can be downloaded).



Using Hyper-V

Start your Hyper-V Manager.

Select New > Virtual Machine… and using the “New Virtual Machine Wizard” create a new virtual machine.



Good to know

Hyper-V appliance currently does not support static network configuration through the CLI. You will need to setup an external DHCP configuration, and configure it to provide a permanent IP address to the VM’s mac-address. Bear this in mind especially if you’re using a virtual switch for WAF connectivity, on Hyper-V Manager. To monitor your network configuration through CLI, you can use “ifconfig”, “show network”, “network [help]”, and “routes [help]” commands.

Step through the wizard

We provide a default name for your WAF instance, and you can change it. Select disk format and mapping settings appropriate for your environment. Do not set WAF-specific properties in the wizard as they are deprecated and will be removed in a future release. You will set properties using the CLI. See Set Up the Appliance using the CLI

Set Up the Appliance using the CLI

Log in as "waf-user" via SSH or System Console

The first login forces you to change your password.

```
$ ssh waf-user@10.1.1.5
You are required to change your password immediately (root
enforced)
WARNING: Your password has expired.
You must change your password now and login again!
Changing password for user waf-user.
New password: C-om34EhbTz.6aiMU4C
Retype new password: C-om34EhbTz.6aiMU4C
passwd: all authentication tokens updated successfully.

Connection to 10.1.1.5 closed.
```

Configuration

Set the required properties: waf_service_url (URL of Qualys Cloud Platform hosting your account) and registration_code. See WAF registration parameters. More properties may be required depending on your networking environment. See CLI Reference for details.

```
$ ssh waf-user@10.1.1.5

qualys waf # help
Commands (type help <command>):
===============================
deregister help passwd save show status viewlog diag ifconfig
reboot set shutdown sysinfo waf exit network routes setup ssh
unset

qualys waf # set
Syntax: set KEY=VALUE
    Valid keys:
       waf_service_url
       proxy_url
       sem_syslog_addr
       registration_code
       waf_ssl_passphrase

qualys waf # set waf_service_url=https://rns.qualys.com
qualys waf # set registration_code=A30BC162-785A-4BAF-A5D5-
1A2DE9C6DA3A
qualys waf # save
Saved Successfully
```

Reboot may be required

...if you are changing the token (e.g. re-registration).

```
qualys waf # reboot
Are you sure you want to reboot?  <y/N> y
Rebooting

Broadcast message from waf-user@dhcp-10-1-1-5
(/dev/pts/0) at 18:05 ...


The system is going down for reboot NOW!
Connection to 10.1.1.5 closed.
```

Verify Registration

You can do this using the CLI as shown below, or the WAF user interface (go to WAF Appliances > WAF Clusters).

```
qualys waf # status
Checking status.... Done.
Connectivity to Qualys: OK
Registration status: OK
Sensor Id: 2b9af5aa-f99e-45bf-86dd-3d45a4d6b3f7
Registration Code: 3F159371-6188-4B7C-8C6D-48E764ADF00D
qualys waf # quit

Connection to 10.1.1.5 closed.
```

Note: When you check the appliance status, “Connectivity to Qualys” may show OK even if you do not set the WAF_SERVICE_URL. This is because WAF_SERVICE_URL takes the default value https://rns.qualys.com:443/ when not explicitly set to a custom value.

That’s it! You’ve configured your WAF virtual appliance. Once you’re done we’ll start a distributed network of sensors for your WAF cluster. Also your WAF cluster will start making outbound connections to the Qualys Cloud Platform.

WAF registration parameters

While registering a WAF appliance, you need to provide WAF registration code and other properties as appropriate using the variables below:

Variable	Description
WAF_SERVICE_URL	(Required) The URL of the Qualys Cloud Platform hosting your Qualys account. Supported platform URLs are: US Platform 1 https://rns.qualys.com US Platform 2 https://rns.qg2.apps.qualys.com US Platform 3 https://rns.qg3.apps.qualys.com EU Platform 1 https://rns.qualys.eu EU Platform 2 https://rns.qg2.apps.qualys.eu India Platform 1 https://rns.qg1.apps.qualys.in Note: When you check the appliance status, “Connectivity to Qualys" may show OK even if you do not set the WAF_SERVICE_URL. This is because WAF_SERVICE_URL takes the default value https://rns.qualys.com:443/ when not explicitly set to a custom value.
REGISTRATION_CODE	(Required) Enter the WAF registration code in this format: REGISTRATION_CODE=your_code. You can find this code by going to the WAF clusters list (WAF Appliances > WAF Clusters).
PROXY_URL	(Required if a proxy is required for the WAF cluster to access the Qualys Cloud Platform) If the WAF needs to connect to the Qualys Cloud Platform through an HTTP proxy, please input the URL of the proxy. Enter the proxy URL in this format: PROXY_URL=proxy_url
WAF_SSL_PASSPHRASE	(Required if the appliance protects a site communicating over SSL) If your web application’s primary or secondary base URL uses the HTTPS protocol, the Qualys Cloud Platform portal protects the private key by encrypting it with a 64 byte dedicated passphrase. This way, it’s not accessible in clear on the Qualys Platform. This WAF_SSL_PASSPHRASE needs to be set on the appliance, for decrypting the key. Enter the passphrase in this format: WAF_SSL_PASSPHRASE=passphrase

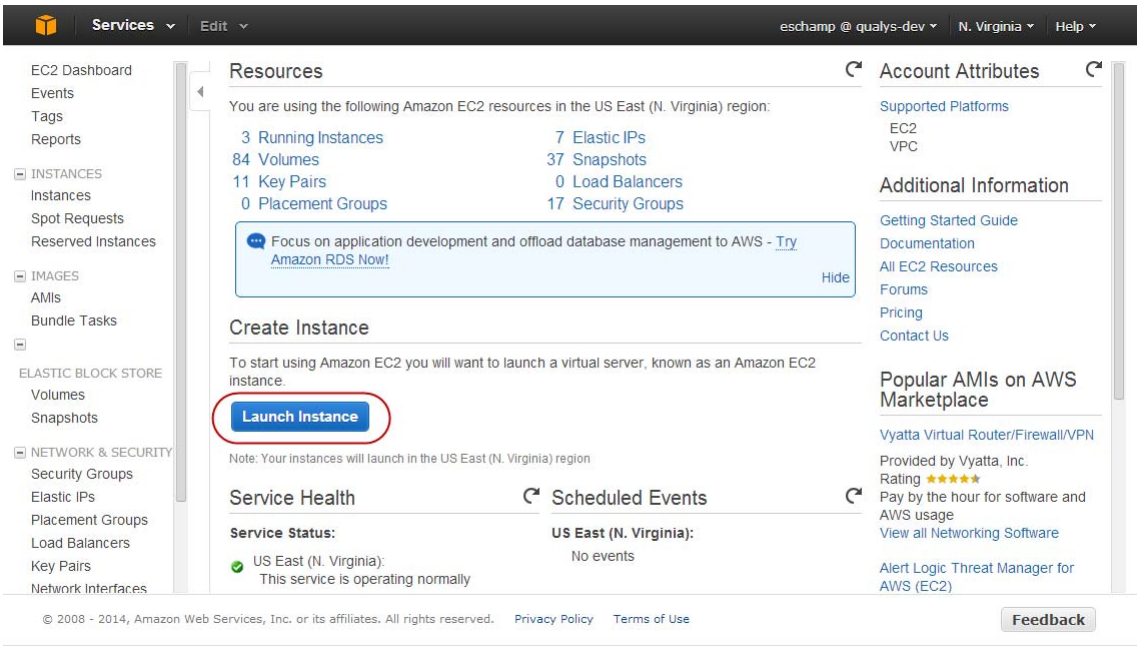
Amazon EC2 Configuration

Follow the steps below to deploy your WAF firewall cluster in Amazon EC2 and configure your DNS. You'll need to funnel traffic through the WAF cluster by changing your DNS.

Once you complete these steps, we'll start monitoring your web application for security violations. Also your WAF cluster will start making outbound connections to the Qualys Cloud Platform for regular health checks - these confirm the cluster is properly configured and has the latest software.

Launch New EC2 Instance

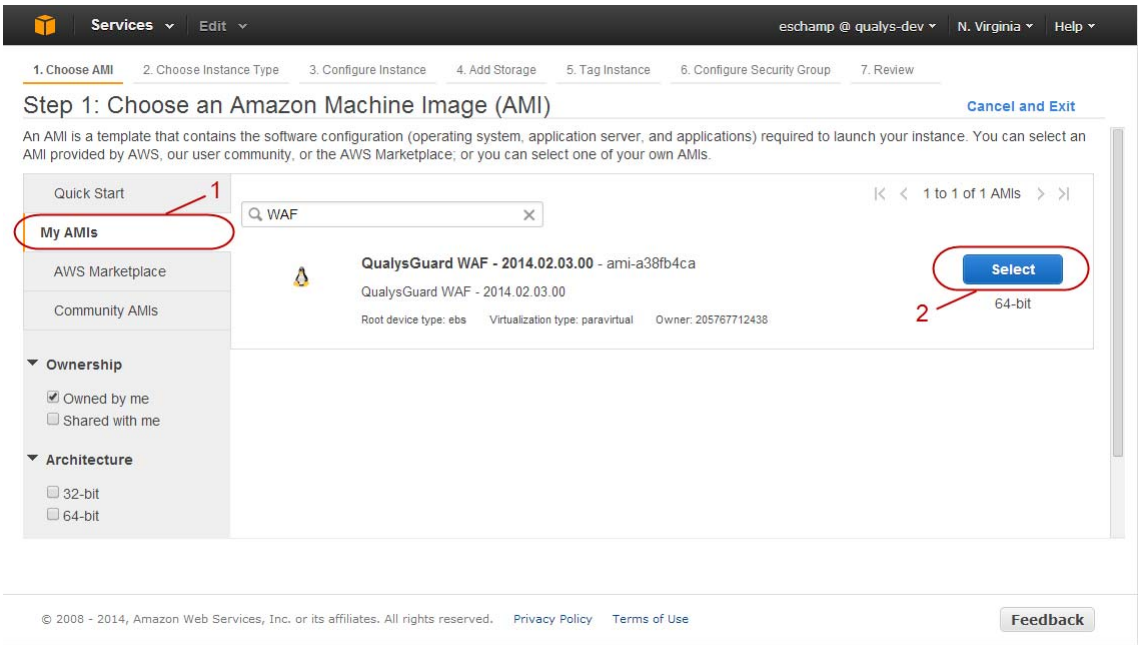
1) Go to your Amazon EC2 Dashboard and launch an instance



2) Choose the WAF AMI

Click My AMIs (1) and then select the QualysGuard WAF AMI (2).

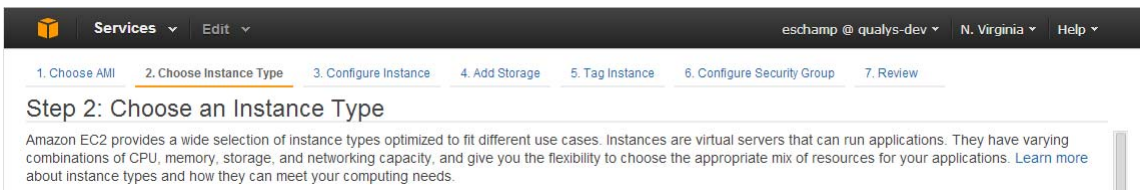
Tip Use the search box to find this quickly. Just enter "WAF" and click Enter.



Don't see the WAF AMI? Please contact your Technical Account Manager or our Support Team for assistance.

3) Choose Instance Type

You'll choose from a wide variety of instance types.



Select an instance type and then click "Next: Configure Instance Details".

4) Configuration

Open Advanced Details. In the User Data field, enter your WAF registration code and other properties as appropriate. See WAF registration parameters.

5) Additional steps (optional)

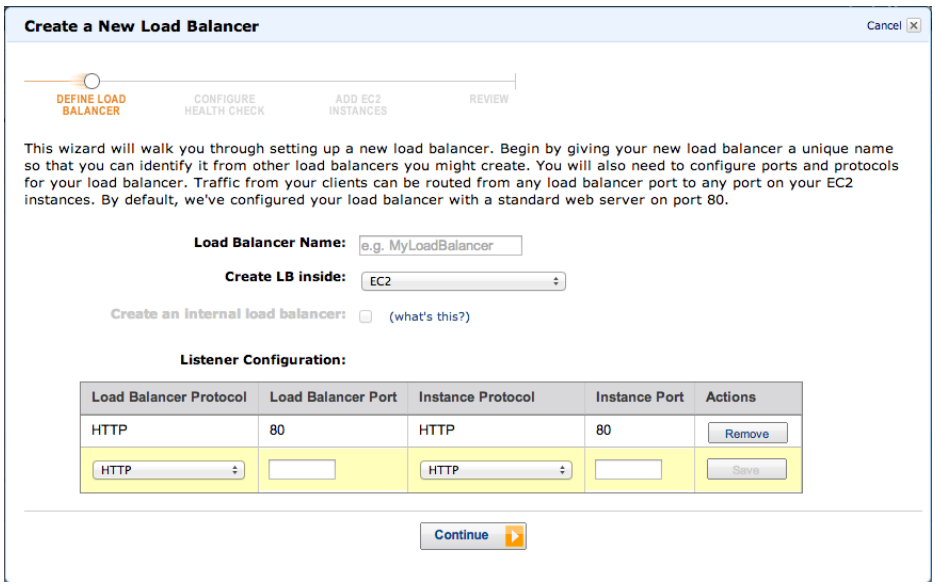
You might want to add storage, tag the instance and configure security groups.

6) Click Review and Launch

Be sure to wait until the WAF AMI status is green (this means it's running). Then you're ready to add the AMI instance to the EC2 load balancer (see the next section).

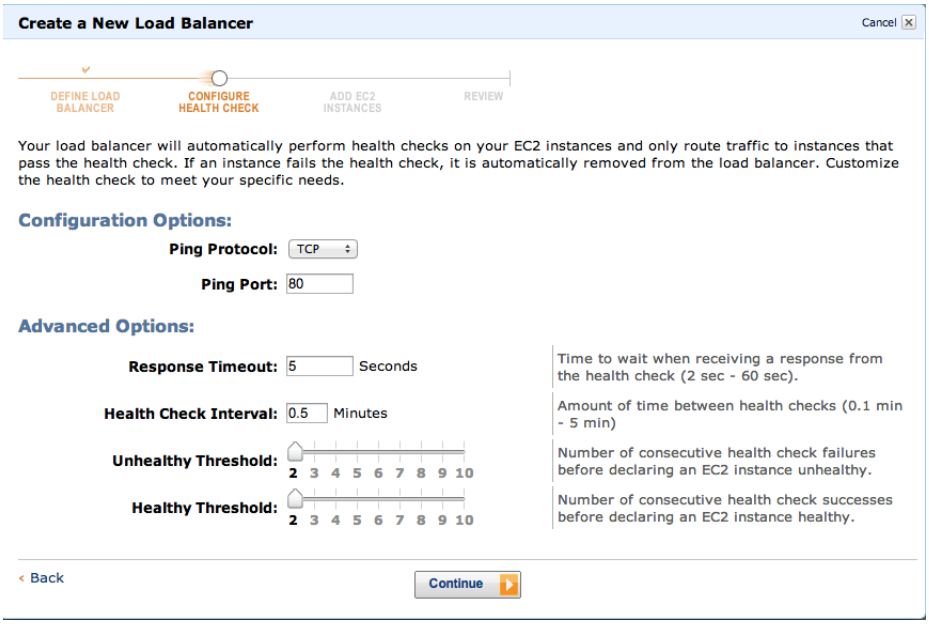
Add Your WAF AMI to the Load Balancer

1) Create an HTTP Load Balancer Instance



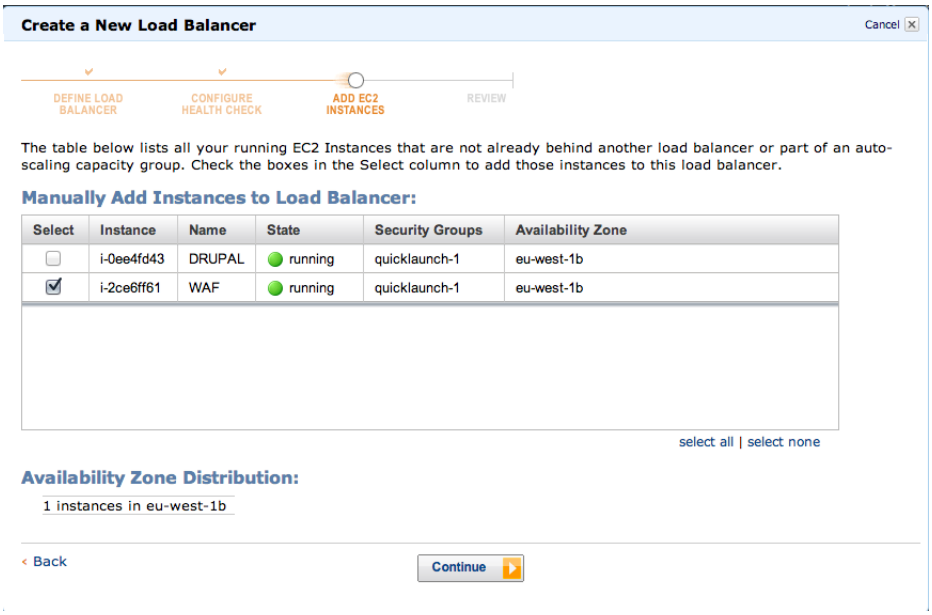
2) Set up your Health Checks

Choose the TCP Ping Protocol option. Later, when your web application is online, you can choose a URL for a comprehensive health check.



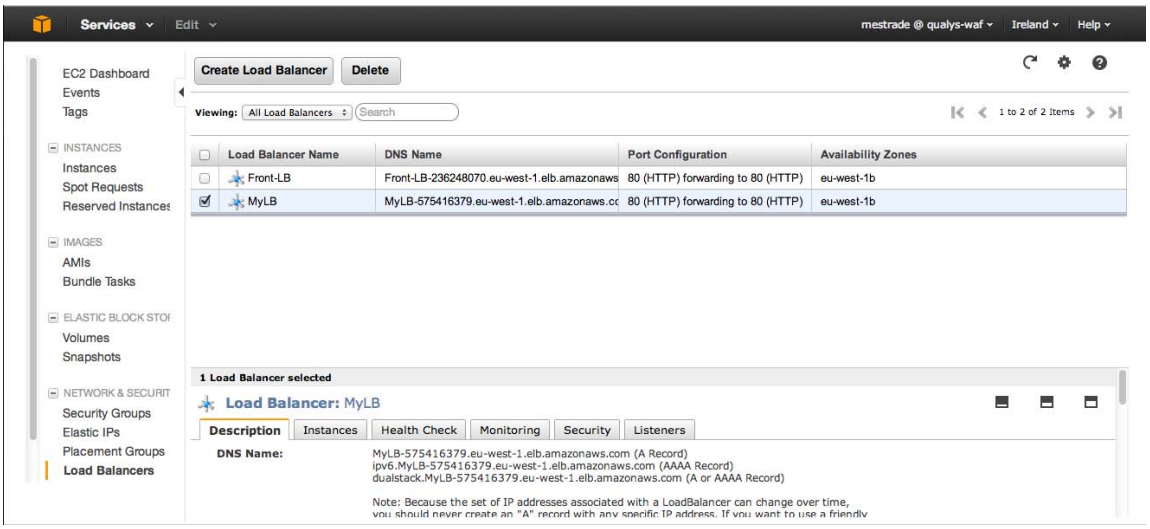
3) Add Your WAF Instance in the Cluster

Click the "Select" check box beside your WAF instance to add it to the load balancer. Your load balancer is now created and will soon be able to handle requests.



4) Redirect Your Traffic to the Load Balancer Hostname

Test the availability of your web application through the load balancer. Once confirmed, you'll need to alias your DNS entries to the Amazon EC2 load balancer you just created.



That's it! You've configured your WAF virtual appliance. Once you're done we'll start a distributed network of sensors for your WAF cluster. Also your WAF cluster will start making outbound connections to the Qualys Cloud Platform (HTTPS over TCP-443).

Microsoft Azure Configuration

Follow the steps below to deploy your WAF firewall on Microsoft Azure.

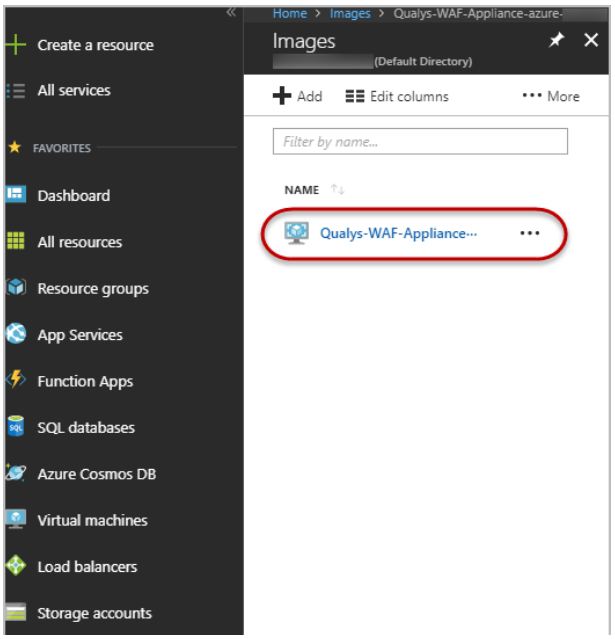
Once you complete these steps, we'll start monitoring your web application for security violations. Also your WAF appliance will start making outbound connections to the Qualys Cloud Platform for regular health checks - these confirm the appliance is properly configured and has the latest software.

Deploy WAF on Azure

1) Go to your Azure Dashboard and under Images find the Qualys WAF image.

Click All services, and then click Images. Search for the WAF image.

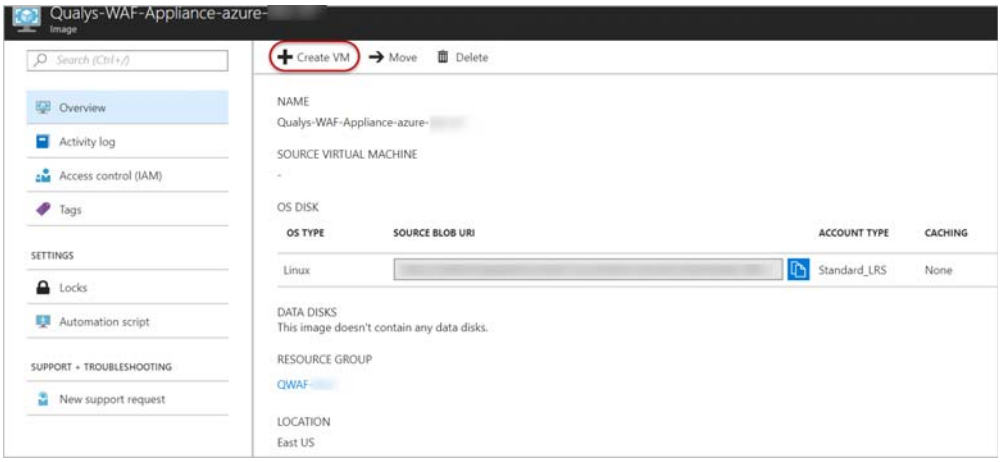
Tip Use the search box to find this quickly. Just enter "WAF" and click Enter.



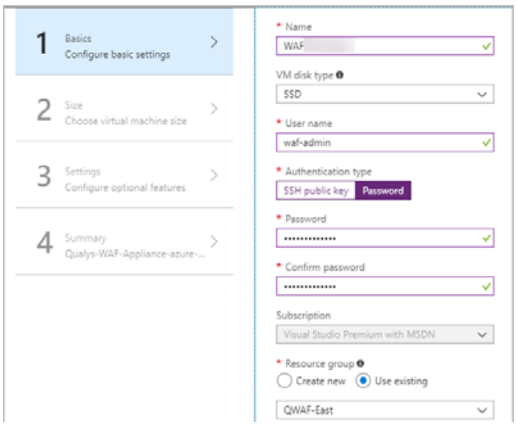
Don't see the WAF image? Please contact your Technical Account Manager or our Support.

2) Create the WAF VM

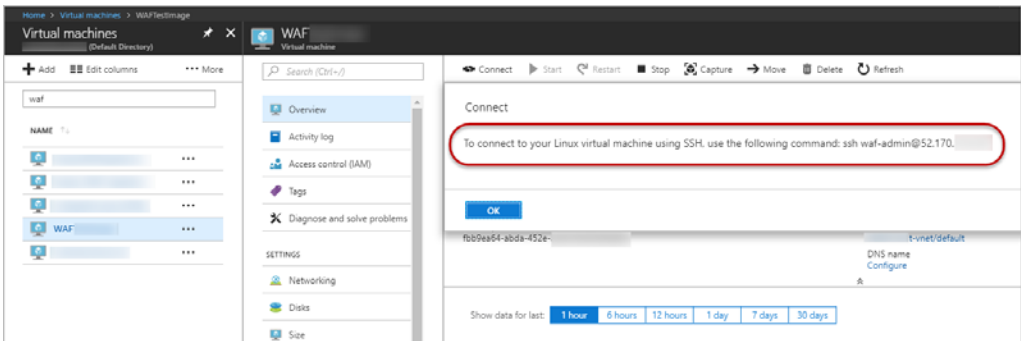
Click the WAF image, and then click Create VM.



Perform Steps 1 to 4 to provide the basic information, choose VM size, and configure network settings for the VM.



Once the VM is created, you get the ssh command to connect to the VM.



4) Register the appliance to Qualys Cloud Platform

Connect to the WAF VM and using the CLI enter your WAF registration code and other properties as appropriate. See WAF registration parameters.

That's it! You've configured your WAF virtual appliance. Your WAF appliance will start making outbound connections to the Qualys Cloud Platform (HTTPS over TCP-443).

Google Cloud Configuration

Follow the steps below to deploy your WAF firewall on Google Cloud Platform (GCP).

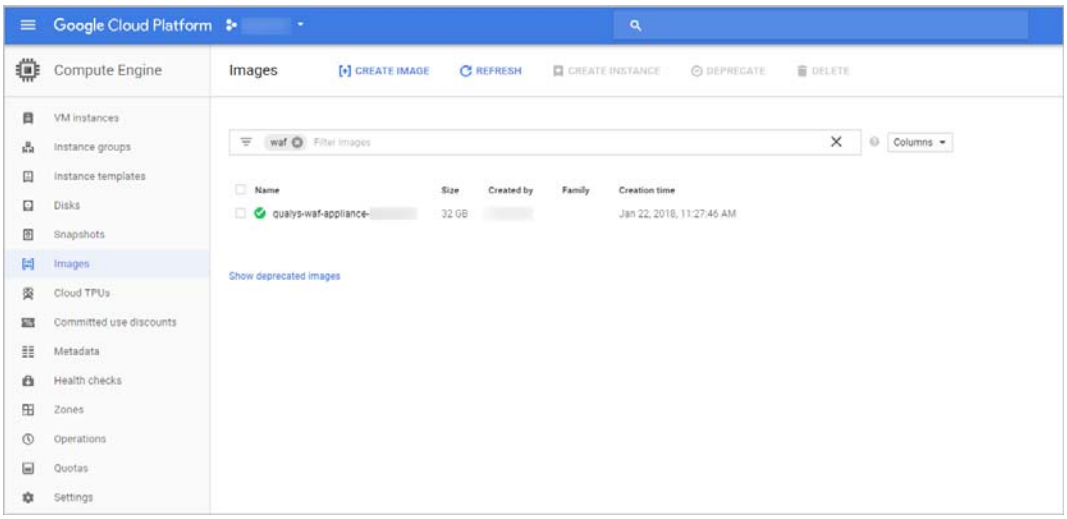
Once you complete these steps, we'll start monitoring your web application for security violations. Also your WAF appliance will start making outbound connections to the Qualys Cloud Platform for regular health checks - these confirm the appliance is properly configured and has the latest software.

Deploy WAF on Google Cloud Platform

1) Go to your GCP Dashboard and under Images find the Qualys WAF image.

Click Images and then search for the WAF image.

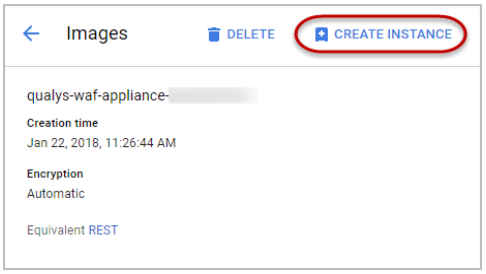
Tip Use the search box to find this quickly. Just enter "WAF" and click Enter.



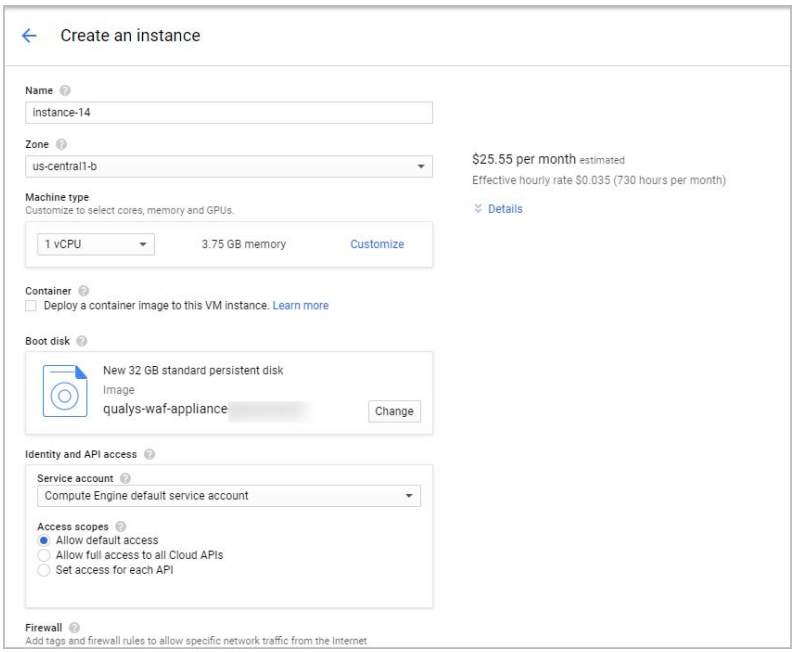
Don't see the WAF image? Please contact your Technical Account Manager or our Support.

2) Create the WAF Instance

Click the WAF image, and then click CREATE INSTANCE.



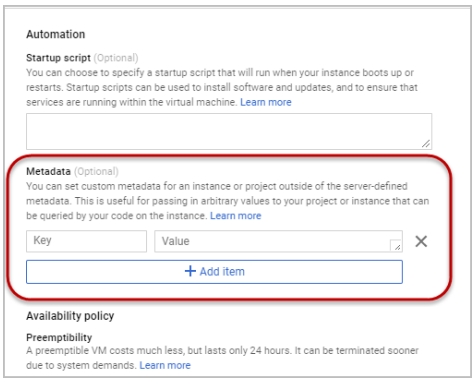
Provide the basic information, choose Machine type, and configure access and network settings for the instance.



3) Register the appliance to Qualys Cloud Platform

You can provide the WAF registration details while creating the instance or later once the instance is created.

To provide WAF registration details during instance creation, enter the variable and values in the form of key value pairs in the Metadata section.



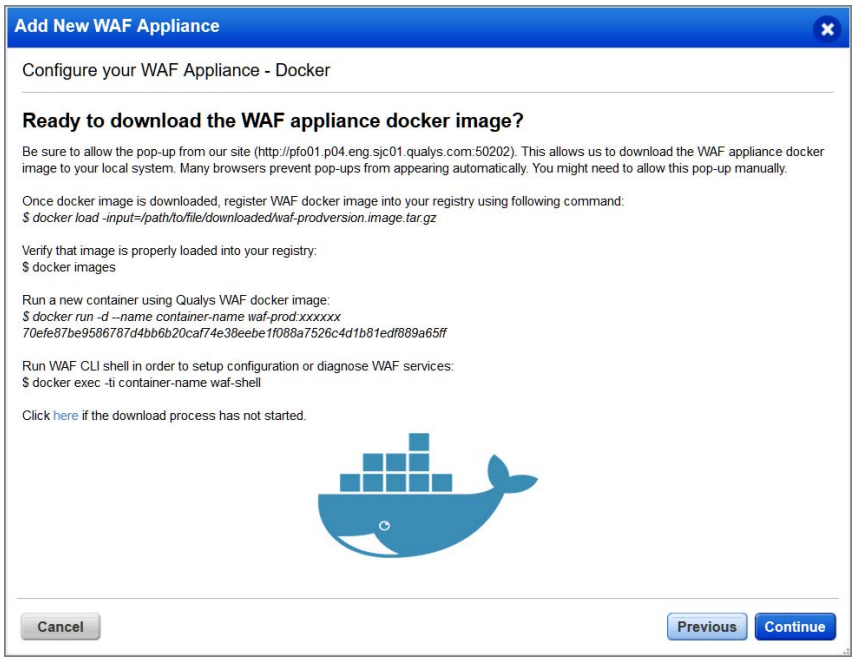
To register a WAF appliance once the instance is created, connect to the WAF instance and using the CLI enter your WAF registration code and other properties as appropriate. See WAF registration parameters.

That's it! You've configured your WAF virtual appliance. Your WAF appliance will start making outbound connections to the Qualys Cloud Platform (HTTPS over TCP-443).

Docker Configuration

You can install the WAF appliance on a docker container.

Go to WAF Appliances > WAF Appliances, and click New WAF Appliance. Select an existing WAF cluster or create a new one. In the Add New WAF Appliance wizard, select Docker and click Continue to download the docker image file.



Refer to the onscreen instructions to create a container from the docker image. Click Continue to get the registration code of the cluster to register the WAF appliance to. See CLI Reference for information on registering the WAF appliance through CLI.

Ensure that the docker container has proper network connectivity for WAF appliance to communicate and register with the Qualys Cloud Platform (WAF_SERVICE_URL) in order to start sending WAF events.

CLI Reference

The command line interface is used to set up the WAF appliance. Commands and Variables are described below.

Commands

Command	Description
help	List all commands or give detailed help for a specific command. For more information about a command, type help followed by the command.
deregister	De-registers the sensor from its cluster and shutdown.

diag [details]	Simple diagnostic tool (nslookup, perfstat, fetchurl, ssl).
	
	Example to forge a specific servername value (SNI):
	`diag ssl www.domain.com:443 "foo.domain.com"`
	
	Example to forge a specific host header value:
	`diag fetchurl https://servername.domain.com "Host: foo.domain.com"`

exit	Exit the CLI. The user will be prompted if there are unsaved changes.
ifconfig	Show the current interface configuration.
network	Configure the network interface, i.e. add, change, delete network route, and set nameservers to be used.
passwd	Change the password for user waf-user.
reboot	Reboot the WAF cluster.
routes	Show network routing.
save	Save the current configuration.
set **`variable`**={value}	Set a key value for configuration.
setup	Helps you set up properties by prompting for registration code, WAF service URL, proxy URL and SSL passphrase.
show [details]	Show the current saved and unsaved settings. Show details will include settings from the virtualization platform.
shutdown	Shutdown the WAF sensor.
ssh	Configure the public ssh keys, i.e. add, delete, list.
status	Display the registration status of the WAF cluster.
sysinfo	Display system information.
viewlog [**n**]	View the last N lines of the WAF cluster log.
waf	Manage the WAF process, i.e. start, stop, restart, reconfigure, get status.

Command	Description
unset **`variable`**	Clear the value for a variable.
ca	Add, Delete or List CA certificates.
core [status|enable|disable]	Enable or disable generating the core dump file upon crash. By default core is enabled.

Variables

Variable	Description
waf_service_url	(Required) The URL of the Qualys Cloud Platform hosting your Qualys account. Supported platform URLs are: US Platform 1 https://rns.qualys.com US Platform 2 https://rns.qg2.apps.qualys.com US Platform 3 https://rns.qg3.apps.qualys.com EU Platform 1 https://rns.qualys.eu EU Platform 2 https://rns.qg2.apps.qualys.eu India Platform 1 https://rns.qg1.apps.qualys.in
registration_code	(Required) Enter the WAF registration code in this format: registration_code=your_code. You can find this code by going to the WAF clusters list (WAF Appliances > WAF Clusters).
proxy_url	(Required if a proxy is required for the WAF cluster to access the Qualys Cloud Platform) If the WAF needs to connect to the Qualys Cloud Platform through an HTTP proxy, please input the URL of the proxy. Enter the proxy URL in this format: proxy_url=proxy_url
waf_ssl_passphrase	(Required if the appliance protects a site communicating over SSL) If your web application's primary or secondary base URL uses the HTTPS protocol, the Qualys Cloud Platform portal protects the private key by encrypting it with a 64 byte dedicated passphrase. This way, it's not accessible in clear on the Qualys Platform. This waf_ssl_passphrase needs to be set on the appliance, for decrypting the key. Enter the passphrase in this format: waf_ssl_passphrase=passphrase
sem_syslog_addr	The Security Event Manager to send transaction logs via syslog to. The syslog messages will be formatted as described in RFC5424. Syntax: **`PROTOCOL:HOSTNAME:PORT`** where PROTOCOL is "tcp" or "udp", and PORT is standard syslog port 514 by default Example: **`TCP:sysloghost.example.com:514`**

Contact Support

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