

FortiOS - IBM Cloud Cookbook

Version 6.4

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FEEDBACK

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October 01, 2020

FortiOS 6.4 IBM Cloud Cookbook

01-640-652433-20201001

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About FortiGate for IBM Cloud

By combining stateful inspection with a comprehensive suite of powerful security features, FortiGate Next Generation Firewall (NGFW) technology delivers complete content and network protection. This solution is available for deployment on IBM Cloud.

In addition to advanced features such as an extreme threat database, vulnerability management, and flow-based inspection, features including application control, firewall, antivirus, IPS, web filter, and VPN work in concert to identify and mitigate the latest complex security threats.



FortiGate-VM for IBM Cloud only supports standalone node deployment. FortiOS 6.4.2 and later versions support IBM Cloud deployment.

Support for active-passive high availability (HA) using two FortiGate nodes is planned for future releases.

Highlights of FortiGate for IBM Cloud include the following:

- Delivers complete content and network protection by combining stateful inspection with a comprehensive suite of powerful security features.
- IPS technology protects against current and emerging network-level threats. In addition to signature-based threat detection, IPS performs anomaly-based detection, which alerts users to any traffic that matches attack behavior profiles.
- New Docker application control signatures protect your container environments from newly emerged security threats. See [FortiGate-VM on a Docker Environment](#).

Instance type support

You can deploy FortiGate-VM on IBM Cloud for Gen1 and Gen2 spaces by importing the FortiGate-VM deployment file as a custom image to your object storage bucket and creating an instance from it. A minimum 2 GB of RAM is required.

Currently there is no specific preference on supported instance types.

Supported instances on the IBM Cloud for new deployments may change without notice.

Region support

FortiGate-VM is available for purchase in all the regions/datacenters that IBM Cloud covers.

Models

FortiGate-VM is available with different CPU and RAM sizes. You can deploy FortiGate-VM on various private and public cloud platforms. The following table shows the models conventionally available to order, also known as BYOL models. See [Order types on page 5](#).

Model name	vCPU	
	Minimum	Maximum
FG-VM01/01v/01s	1	1
FG-VM02/02v/02s	1	2
FG-VM04/04v/04s	1	4
FG-VM08/08v/08s	1	8
FG-VM16/016v/016s	1	16
FG-VM32/032v/032s	1	32
FG-VMUL/ULv/ULs	1	Unlimited



The v-series and s-series do not support virtual domains (VDMs) by default. To add VDMs, you must separately purchase perpetual VDM addition licenses. You can add and stack VDMs up to the maximum supported number after initial deployment.

Any RAM size with certain CPU models are allowed. Licenses are based on the number of CPUs only.

For information about each model's order information, capacity limits, and adding VDMs, see the [FortiGate-VM datasheet](#).

Licensing

You must have a license to deploy FortiGate for IBM Cloud.

Order types

On general public clouds, there are usually two order types: BYOL and on-demand.

FortiGate-VM deployable on IBM Cloud supports only BYOL.

BYOL offers perpetual (normal series and v-series) and annual subscription (s-series) licensing as opposed to on-demand, which is a term-based subscription available with marketplace-listed products. BYOL licenses are available for purchase from resellers or your distributors, and the publicly available price list, which is updated quarterly, lists prices. BYOL licensing provides the same ordering practice across all private and public clouds, no matter what the platform is. You must activate a license for the first time you access the instance from the GUI or CLI before you can start using various features.

In both BYOL and on-demand, cloud vendors charge separately for resource consumption on computing instances, storage, and so on, without use of software running on top of it (in this case the FortiGate-VM).

For BYOL, you typically order a combination of products and services including support entitlement. New s-series SKUs contain the VM base and service bundle entitlements for easier ordering. PAYG includes support, for which you must contact [Fortinet Support](#) with your customer information.

Creating a support account

FortiGate for IBM Cloud supports only the BYOL licensing model. See [Order types on page 5](#).

To make use of Fortinet technical support and ensure products function properly, you must complete certain steps to activate your entitlement. Our support team can identify your registration in the system thereafter.

First, if you do not have a Fortinet account, you can [create one](#).

BYOL

You must obtain a license to activate the FortiGate. If you have not activated the license, you see the license upload screen when you log into the FortiGate and cannot proceed to configure the FortiGate.

You can obtain licenses for the BYOL licensing model through any Fortinet partner. If you do not have a partner, contact your nearest Fortinet sales office for assistance in purchasing a license.

After you purchase a license or obtain an evaluation license (60-day term), you receive a PDF with an activation code.

To register the BYOL license:

1. Go to [Fortinet Service & Support](#) and create a new account or log in with an existing account.
2. Go to *Asset > Register/Activate* to start the registration process. In the *Specify Registration Code field*, enter your license activation code and select *Next* to continue registering the product. Enter your details in the other fields.
3. At the end of the registration process, download the license (.lic) file to your computer. You upload this license later to activate the FortiGate-VM.
After registering a license, Fortinet servers may take up to 30 minutes to fully recognize the new license. When you upload the license (.lic) file to activate the FortiGate-VM, if you get an error that the license is invalid, wait 30 minutes and try again

Deploying FortiGate-VM on IBM Cloud


FortiOS 6.4.2 adds support for deploying FortiGate-VM BYOL for the IBM Cloud platform. IBM Cloud platform users can purchase and deploy FortiGate-VMs. The following describes the steps that you take to create and access a FortiGate-VM BYOL instance in the IBM Cloud.

To deploy FortiGate-VM on IBM Cloud using the GUI:

1. Obtain the .qcow2 image file:
 - a. Log in to the [Fortinet Support site](#).
 - b. Go to *Download > VM Images*.
 - c. From the *Select Platform* dropdown list, select *IBM VPC Cloud*.
 - d. Download the FortiGate-VM deployment file (FGT_VM64_IBM-v6-buildXXXX-FORTINET.out.kvm.zip).
 - e. Extract the zip file to get a .qcow2 file.
2. Log in to the IBM Cloud portal.
3. Prepare an object storage bucket on IBM VPC.
4. Upload the .qcow2 image file.
5. Import the custom image:
 - a. Go to *VPC Infrastructure (Gen 2) > Compute > Custom images*.
 - b. Click *Import custom image*.
 - c. Import the custom image. You must enter a name and select a region. Select the .qcow2 image file uploaded

earlier, and select Ubuntu 16.04 for the operating system.

VPC Infrastructure / All custom images for VPC



Gen 2 compute
This custom image will be created for use with generation 2 compute resources. It cannot be used with generation 1 instances.
[Switch to Gen 1 compute](#)

Import custom image

Name

Resource group
The resource group can't be changed after the custom image is created
[Learn about resource groups](#)

Default

[View all resource groups](#)

Tags

Region

Dallas

Frankfurt

London

Washington DC

Select your Cloud Object Storage bucket and select your image file below. [How to upload to Cloud Object Storage.](#)

Images must be a qcow2 file type, 100GB or less and cloud-init enabled.


Cloud Object Storage instances	Location	Bucket
thomasobjectstore	us-east	thomasbucket

Prefix filter


Name	Size	Last Modified
<input checked="" type="radio"/> fortios.qcow2	58.63 MB	July 9, 2020 12:23:19 PM

Items per page: 10 | 1 item | Page 1


Operating system




CentOS
7.x - Minimal Install




Debian GNU/Lin...
debian-8-amd64



Red Hat Enterpr...
7.x - Minimal Install



Ubuntu Linux
ubuntu-16-04-amd64



Windows Server
windows-2012-amd

Summary United States

1 Image \$0.01
0.06 GB

Apply a code

Total monthly cost* \$0.01
estimated

</>

Need help?
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Terms
[Virtual Server](#)
[Virtual Private Cloud](#)
[Block Storage](#)

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6. Create a new instance based on the custom image. Enter a name, select the VPC, location, custom image imported earlier, profile, SSH key, and user data. User data can be from the IBM bucket, config-url/license-url, or directly inputted in the form of a config, license, or MIME file. See the following example:

```
{
  "bucket" : "lzou-bucket1",
  "region" : "eu-gb",
  "license" : "FGVM16TM19000211.lic",
  "config" : "config.txt",
  "apikey": "{{omitted}}"
}
```

The following example includes the license-url and config-url:

```
{
  "license-url" : "http://ec2-54-151-72-112.us-west-1.compute.amazonaws.com/FGVM16TM19000211.lic",
  "config-url" : "http://ec2-54-151-72-112.us-west-1.compute.amazonaws.com/config.txt" }
}
```

IBM Cloud | Catalog | Docs | Support | Manage

New virtual server for VPC

Name
fosinstance

Virtual private cloud
thomas-vpc-general

Resource group
Default

Location
Washington DC

Image
fortios1705

Popular profiles

- Balanced**: 8 vCPUs, 32 GB RAM, 16 Gbps
- Compute**: 2 vCPUs, 4 GB RAM, 4 Gbps
- Memory**: 2 vCPUs, 16 GB RAM, 4 Gbps

Summary | United States

- Virtual server instance**: \$0.09/hr
2 vCPUs, 4 GB RAM, 4 Gbps, Custom image
- Boot volume**: \$0.02/hr
100 GB
- Network interface**: provided

Subtotal: \$78.04
Sustained usage discount: -\$6.58
Total monthly cost*: \$71.46 (estimated)

[Create virtual server instance](#)

7. Attach a floating IP address to the instance NIC.
8. In a browser, go to the IP address to connect to the FortiOS GUI and confirm that the instance is running.

To deploy FortiGate-VM on IBM Cloud using the CLI:

```
ibmcloud # diagnose debug cloudinit show
>> Checking metadata source ibm
>> Found nocloud drive /dev/vdb
>> Successfully mounted nocloud drive
>> Setting password to instance id
>> Provisioning ssh key
>> Cloudinit curl header:
>> Cloudinit trying to get license from:
    https://thomasqabucket2.s3.amazonaws.com/FGVM08TM20004028.lic
>> Cloudinit download license successfully
>> Cloudinit trying to get config script from:
    https://thomasqabucket2.s3.amazonaws.com/config2.txt
>> Cloudinit download config script successfully
>> Found metadata source: ibm
>> Trying to install vmlicense ...
>> Run config script
>> Finish running script
>> FGVM08TM20004028 $ config system global
>> FGVM08TM20004028 (global) $ set hostname ibmcloud
>> FGVM08TM20004028 (global) $ end

get system status
Version: FortiGate-VM64-IBM v6.4.0,buidl1705,200708 (interim)
Virus-DB: 1.00000 (2018-04-09 18:07)
Extended DB: 1.00000 (2018-04-09 18:07)
Extreme DB: 1.00000 (2018-04-09 18:07)
IPS-DB: 6.00741 (2015-12-01 02:30)
IPS-ETDB: 6.00741 (2015-12-01 02:30)
APP-DB: 6.00741 (2015-12-01 02:30)
INDUSTRIAL-DB: 6.00741 (2015-12-01 02:30)
Serial-Number: FGVM08TM20004028
IPS Malicious URL Database: 1.00001 (2015-01-01 01:01)
License Status: Valid
License Expiration Date: 2021-05-15
VM Resources: 2 CPU/8 allowed, 3689 MB RAM
Log hard disk: Not available
Hostname: ibmcloud
Operation Mode: NAT
Current virtual domain: root
Max number of virtual domains: 10
Virtual domains status: 1 in NAT mode, 0 in TP mode
Virtual domain configuration: disable
FIPS-CC mode: disable
Current HA mode: standalone
Branch point: 1705
Release Version Information: interim
FortiOS x86-64: Yes
System time: Thu Jul 9 15:14:00 2020
```

Security Fabric Connector integration with IBM Cloud

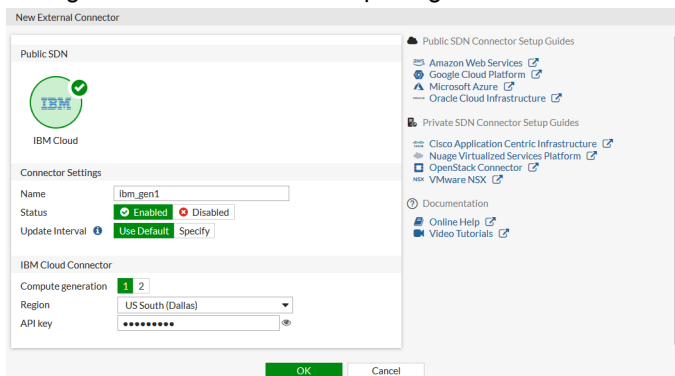
FortiOS can automatically update dynamic addresses for IBM Cloud using an SDN connector.

The dynamic addresses can be filtered with the following filters:

- <InstanceId>
- <InstanceName>
- <ImageId>
- <ImageName>
- <Architecture>
- <Profile>
- <Vpc>
- <Zone>
- <Subnet>
- <ResourceGroup>

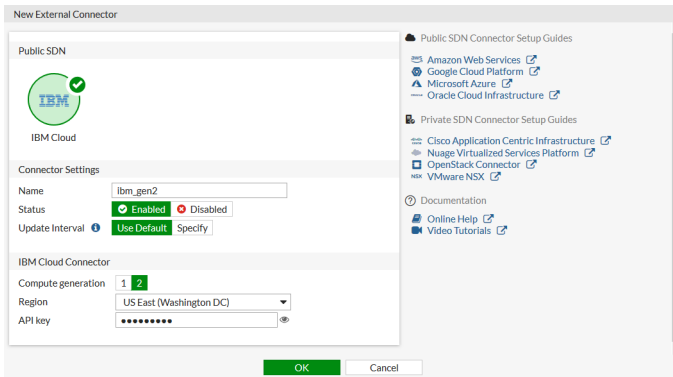
To configure IBM Cloud SDN connectors using the GUI:

1. Create SDN connectors for compute generation 1 and 2:
 - a. Go to *Security Fabric > External Connectors*.
 - b. Click *Create New*, then select *IBM Cloud*.
 - c. Configure the connector for computer generation 1:



- d. Click *OK*.
- e. Click *Create New*, then select *IBM Cloud*.

f. Configure the connector for computer generation 2:



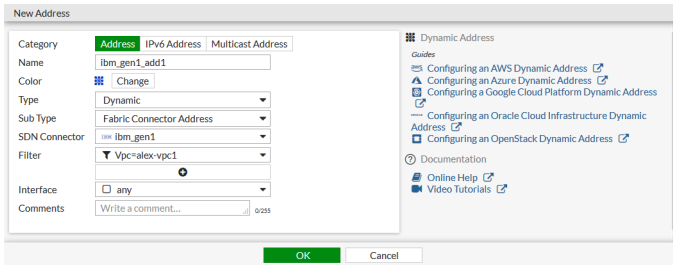
g. Click **OK**.

2. Create dynamic firewall addresses for the configured connectors:

a. Go to *Policy & Objects > Addresses*.

b. Click *Create New > Address*.

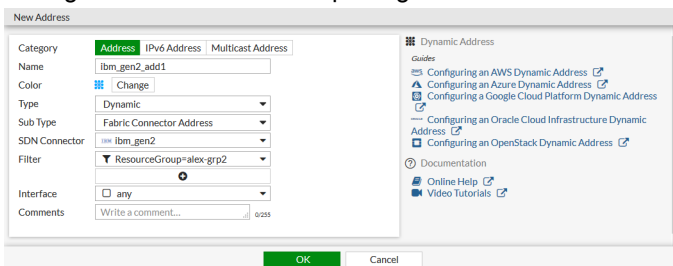
c. Configure an address for computer generation 1:



d. Click **OK**.

e. Click *Create New > Address*.

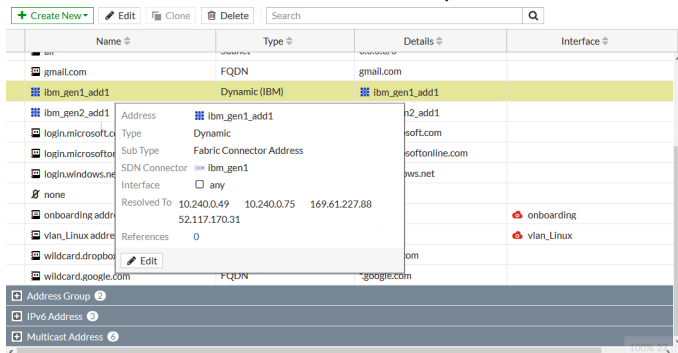
f. Configure an address for computer generation 2:



g. Click **OK**.

3. Ensure that the connectors resolve dynamic firewall IP addresses:

- a. Go to *Policy & Objects > Addresses*.
- b. Hover over the addresses created in step 2 to see a list of IP addresses resolved by the connector:



To configure IBM Cloud SDN connectors using the CLI:

1. Create SDN connectors for compute generation 1 and 2:

```
config system sdn-connector
  edit "ibm_gen1"
    set status enable
    set type ibm
    set api-key xxxxxx
    set compute-generation 1
    set ibm-region-gen1 us-south
    set update-interval 60
  next
  edit "ibm_gen2"
    set status enable
    set type ibm
    set api-key xxxxxx
    set compute-generation 2
    set ibm-region-gen2 us-east
    set update-interval 60
  next
end
```

2. Create dynamic firewall addresses for the configured connectors:

```
config firewall address
  edit "ibm_gen1_add1"
    set type dynamic
    set sdn "ibm_gen1"
    set color 19
    set filter "Vpc=alex-vpc1"
  next
  edit "ibm_gen2_add1"
    set type dynamic
    set sdn "ibm_gen2"
    set color 19
    set filter "ResourceGroup=alex-grp2"
  next
end
```

3. Ensure that the connectors resolve dynamic firewall IP addresses:

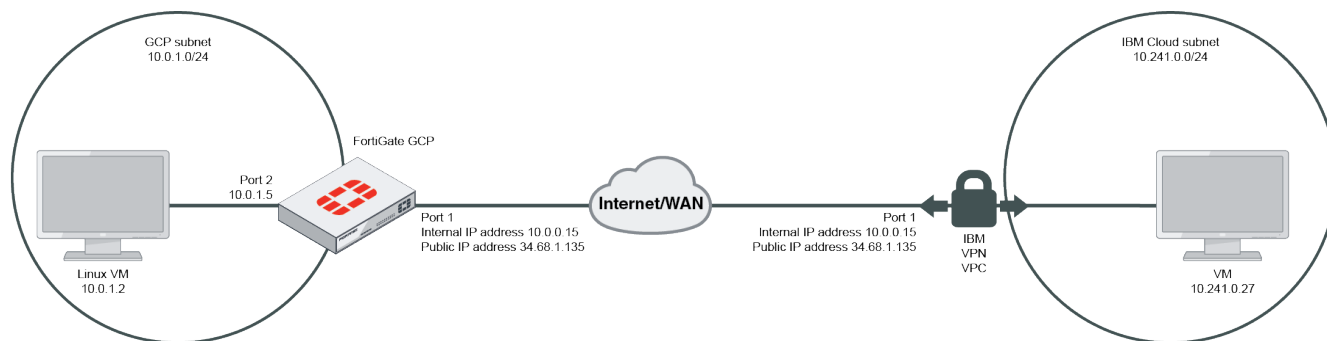
```
# show firewall address ibm_gen1_add1
config firewall address
  edit "ibm_gen1_add1"
    set uuid 586841c4-7f46-51ea-dc66-dbf840af03d3
    set type dynamic
    set sdn "ibm_gen1"
    set color 19
    set filter "Vpc=alex-vpcl"
    config list
      edit "10.240.0.49"
      next
      edit "10.240.0.75"
      next
      edit "169.61.227.88"
      next
      edit "52.117.170.31"
      next
    end
  next
end

# show firewall address ibm_gen2_add1
config firewall address
  edit "ibm_gen2_add1"
    set uuid 5868c4f0-7f46-51ea-2b79-b5170fbfd4a8
    set type dynamic
    set sdn "ibm_gen2"
    set color 19
    set filter "ResourceGroup=alex-grp2"
    config list
      edit "10.241.128.4"
      next
      edit "10.241.128.5"
      next
      edit "10.241.129.4"
      next
      edit "52.117.126.69"
      next
    end
  next
end
```

VPN for FortiGate-VM on IBM Cloud

Connecting a FortiGate to an IBM Cloud VPC VPN

This example provides sample configuration of a site-to-site VPN connection from a FortiGate-VM deployed on Google Cloud Platform (GCP) to an IBM Cloud VPC VPN. Since IBM Cloud VPN requires a peer gateway IP address, it cannot be dialed up to and requires a public IP address from the FortiGate. Therefore, this example uses GCP as the secondary site. The secondary site can be other locations, such as AWS, Azure, or your corporate network. Replace with your desired environment. The following shows the topology for this example:



To create the VPN gateway on IBM Cloud:

1. In the IBM Cloud management console, create a gateway. In the *VPN gateway name* field, enter the desired name.
2. From the *Virtual private cloud* dropdown list, select the desired VPC.
3. (Optional) From the *Resource group* dropdown list, select the desired group.
4. Under *Region*, select the desired region.
5. Under *Subnet*, select the public subnet.
6. Enable *New VPN connection for VPC*, then configure the VPN connection:
 - a. In the *VPN connection name* field, enter the desired name.
 - b. In the *Peer gateway address* field, enter the FortiGate public gateway IP address. In this example, the FortiGate is deployed on GCP, and its public gateway IP address is 34.68.1.135.
 - c. In the *Preshared key* field, enter the desired key.
 - d. Under *Local subnets*, enter the IBM Cloud internal subnet. In this example, it is 10.241.0.0/24.
 - e. Under *Peer subnets*, enter the secondary site internal subnet. In this example, the GCP internal subnet is 10.0.1.0/24.

Subnet
Only the resources in the same zone as the selected subnet can connect through this VPN gateway.

Name	IP Range	Zone	Available IP Addresses
<input type="radio"/> internal	Recommended 10.241.1.0/24	us-east-1	249 of 256
<input checked="" type="radio"/> public	Recommended 10.241.0.0/24	us-east-1	248 of 256

Items per page: 5 1-2 items Page 1

New VPN connection for VPC

Enable to create a VPN connection now, or create a connection after your VPN gateway is provisioned.

Connection details

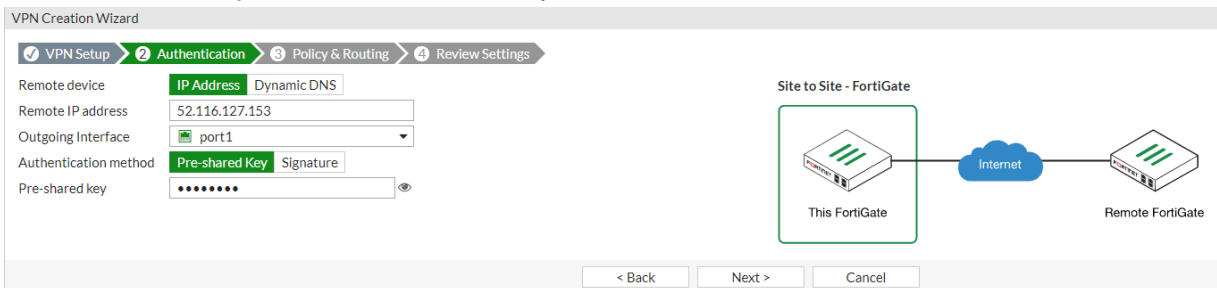
VPN connection name: vpnconnection
Peer gateway address: 34.68.1.135
Preshared key:

Local subnets: 10.241.0.0/24
Peer subnets: 10.0.1.0/24

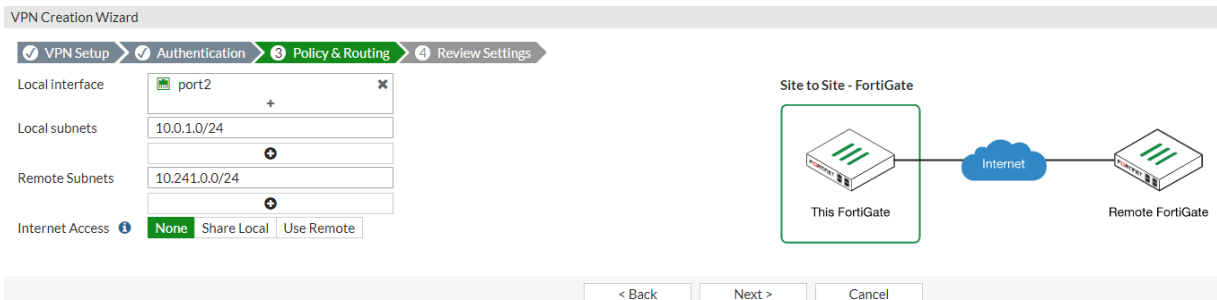
- f. Keep the *Dead peer detection* fields at their default values: *Action: Restart*, *Interval (sec): 2*, and *Timeout (sec): 10*.
- g. Select *New IKE policy*:
 - i. In the *Name* field, enter the desired name.
 - ii. (Optional) From the *Resource group* dropdown list, select the desired group.
 - iii. Under *Region*, select the desired region.
 - iv. From the *IKE Version* dropdown list, select *1*.
 - v. From the *Authentication* dropdown list, select *sha1*.
 - vi. From the *Encryption* dropdown list, select *aes128*.
 - vii. From the *DH Group* dropdown list, select *5*.
 - viii. In the *Key Lifetime* field, enter *86400*.
 - ix. Click *Create IKE policy*.
- h. Select *New IPsec policy*:
 - i. In the *Name* field, enter the desired name.
 - ii. (Optional) From the *Resource group* dropdown list, select the desired group.
 - iii. Under *Region*, select the desired region.
 - iv. From the *Authentication* dropdown list, select *sha1*.
 - v. From the *Encryption* dropdown list, select *aes128*.
 - vi. From the *DH Group* dropdown list, select *5*.
 - vii. In the *Key Lifetime* field, enter *43200*.
 - viii. Click *Create IPsec policy*.

To create the VPN connection in FortiOS:

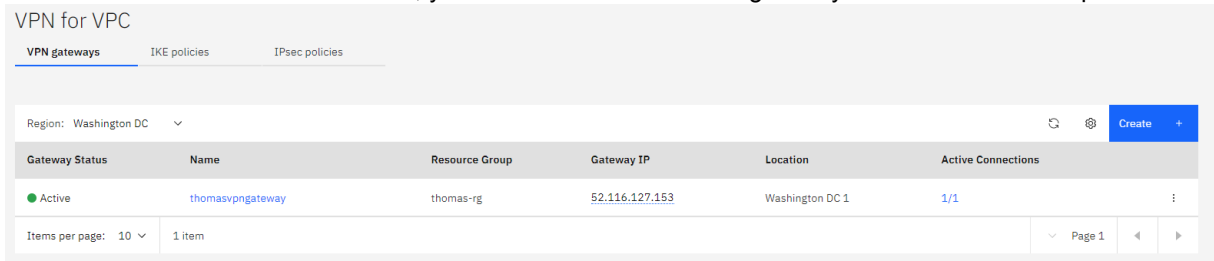
1. In FortiOS on the local FortiGate, go to *VPN > IPsec Wizard*.
2. On the *VPN Setup* tab, configure the following:
 - a. In the *Name* field, enter the desired name.
 - b. For *Template type*, select *Site to Site*.
 - c. For *NAT Configuration*, select *No NAT between sites*.
 - d. For *Remote device type*, select *FortiGate*.
3. On the *Authentication* tab, configure the following:
 - a. For *Remote device*, select *IP Address*.
 - b. In the *Remote IP address* field, enter the IBM Cloud VPN gateway IP address. In this example, it is 52.116.127.153.
 - c. For *Outgoing Interface*, allow FortiOS to automatically configure as port1.
 - d. For *Authentication Method*, select *Pre-shared Key*.
 - e. In the *Pre-shared Key* field, enter the desired key. Click *Next*.



4. On the *Policy & Routing* tab, configure the following:
 - a. For *Local interface*, select *port2*, the GCP internal network port.
 - b. In the *Local subnets* field, enter the GCP internal subnet, 10.0.1.0/24.
 - c. In the *Remote Subnets* field, enter the IBM Cloud remote subnet. In this example, it is 10.241.0.0/24.
 - d. For *Internet Access*, select *None*.



5. Proceed to create the VPN connection. After configuration, the VPN should automatically come up, and traffic can transverse. In the IBM Cloud console, you should see that the VPN gateway status is active and up.



VPC Infrastructure / All VPN gateways for VPC / thomasvpngateway ● Active

VPN gateway details

- Name: thomasvpngateway
- Virtual private cloud: thomas-vpc-general
- Resource group: thomas-rg
- Subnet: public
- ID: 0757-0513c4d8-f8d1-4c3f-b348-c4e655d759f
- IP address: 52.116.127.153
- Created: September 21, 2020 3:38:23 PM
- Location: Washington DC 1

Monitoring preview

Data is based on sum of each metric over the last hour. For more details, or to specify a time range, visit the [monitoring](#) page or the Sysdig dashboard.

Type	Kibibytes	Packets
Data received	0	0
Data transmitted	0	0

[Launch monitoring](#)

VPN connections

Status	Connection Name	Peer Address	IKE Policy	IPsec Policy	State
● Active	thomasvpnconnection	34.68.1.135	newpolicy	test	Enabled

FortiOS also shows that the VPN connection is up.

FortiOS configuration page showing Site-to-Site VPN tunnel configuration. The tunnel 'toIBMVPN' is shown with status 'Up'.

Tunnel	Interface Binding	Status	Ref.
toIBMVPN	port1	Up	4

A GCP Linux client can ping a machine on the IBM Cloud VPC subnet.

```
root@thomas-script-ubuntu-internal:~# ifconfig
ens4: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1460
    inet 10.0.1.2 netmask 255.255.255.255 broadcast 0.0.0.0
    inet6 fe80::4001:aaff:fe00:102 prefixlen 64 scopeid 0x20<link>
    ether 42:01:0a:00:01:02 txqueuelen 1000 (Ethernet)
    RX packets 4837 bytes 9646082 (9.6 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 4473 bytes 450838 (450.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 122 bytes 10696 (10.6 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 122 bytes 10696 (10.6 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@thomas-script-ubuntu-internal:~# ping 10.241.0.27
PING 10.241.0.27 (10.241.0.27) 56(84) bytes of data:
64 bytes from 10.241.0.27: icmp_seq=1 ttl=253 time=37.2 ms
64 bytes from 10.241.0.27: icmp_seq=2 ttl=253 time=35.4 ms
^C
--- 10.241.0.27 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1001ms
rtt min/avg/max/mdev = 35.483/36.386/37.289/0.903 ms
```

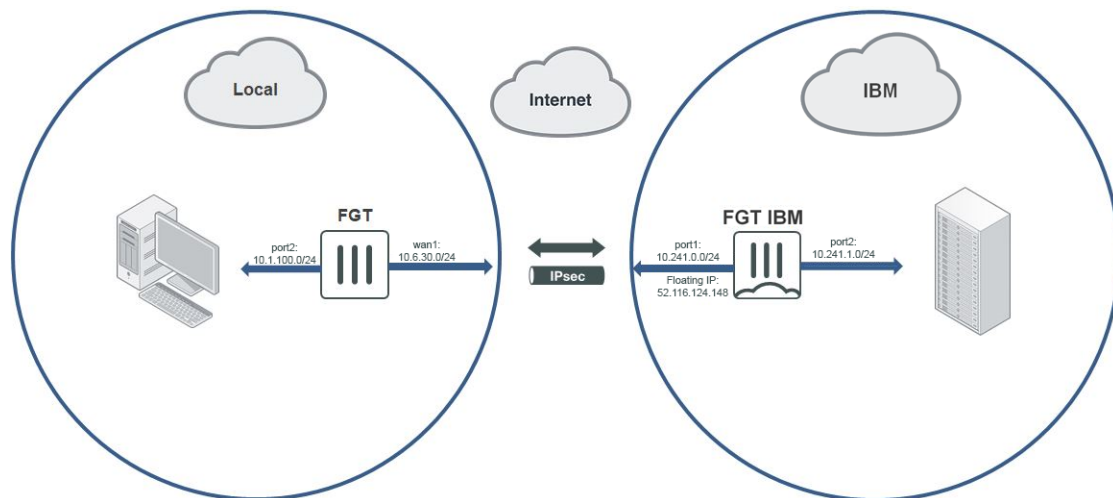
The following shows sniffer traffic.

```
SCRIPT-MASTER # diagnose sniffer packet any 'icmp' 4
interfaces=[any]
filters=[icmp]
11.688528 port2 in 10.0.1.2 -> 10.241.0.27: icmp: echo request
11.688578 toIBMVPN out 10.0.1.2 -> 10.241.0.27: icmp: echo request
11.723878 toIBMVPN in 10.241.0.27 -> 10.0.1.2: icmp: echo reply
11.723905 port2 out 10.241.0.27 -> 10.0.1.2: icmp: echo reply
```

Connecting a local FortiGate to an IBM Cloud FortiGate via site-to-site VPN

This guide provides sample configuration of a site-to-site VPN connection from a local FortiGate to an IBM FortiGate via site-to-site IPsec VPN with static routing. You can access resources that are protected behind a FortiGate on IBM from your local environment by using a site-to-site VPN.

The following depicts the network topology for this sample deployment:



The following prerequisites must be met for this configuration:

- A FortiGate located on (Gen 2) IBM Cloud Virtual Servers for VPC with some resources behind it. In this example, the IBM FortiGate has port1 connected to WAN and port2 connected to local LAN.
- An on-premise FortiGate. For your local environment, determine if your FortiGate has a publicly accessible IP address or if it is behind NAT. In this example, the on-premise FortiGate is behind NAT.

This configuration consists of the following steps:

1. [Create a VPN on the local FortiGate to the IBM FortiGate.](#)
2. [Create a VPN on the IBM FortiGate to the local FortiGate.](#)
3. [Establish a connection between the FortiGates.](#)

To create a VPN on the local FortiGate to the IBM FortiGate:

1. In FortiOS on the local FortiGate, go to *VPN > IPsec Wizard*.
2. On the *VPN Setup* tab, configure the following:
 - a. In the *Name* field, enter the desired name.
 - b. For *Template Type*, select *Site to Site*.
 - c. For *Remote Device Type*, select *FortiGate*.
 - d. For *NAT Configuration*, select the appropriate option. In this example, since the local FortiGate is behind NAT, *This site is behind NAT* is selected. Click *Next*. For non-dialup situations where the local FortiGate has an external IP address, select *No NAT between sites*.

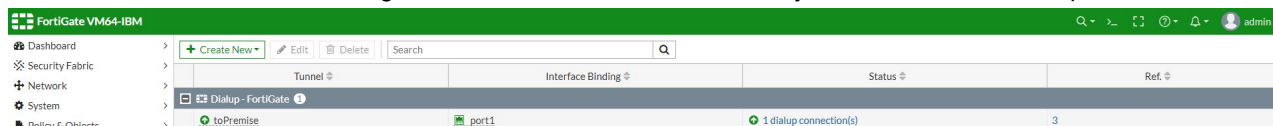
3. On the *Authentication* tab, configure the following:
 - a. For *Remote Device*, select *IP Address*.
 - b. In the *IP Address* field, enter the IBM FortiGate's floating IP address. In this example, it is 52.116.124.148.
 - c. For *Outgoing Interface*, allow FortiOS to detect the interface via routing lookup.
 - d. For *Authentication Method*, select *Pre-shared Key*.
 - e. In the *Pre-shared Key* field, enter the desired key. Click *Next*.
4. On the *Policy & Routing* tab, configure the following:
 - a. For *Local Interface*, select the desired local interface. In this example, port2 is selected. The *Local Subnets* field should autopopulate.
 - b. In the *Remote Subnets* field, enter the remote subnet on the other side of the IBM FortiGate. In this example, it is 10.241.1.0/24.
 - c. For *Internet Access*, select *None*.
5. Click *Create*. The IPsec Wizard creates the following:
 - Firewall addresses for local and remote subnets
 - Firewall address groups containing the above firewall addresses
 - phase-1 and phase-2 interfaces
 - Static route and blackhole route
 - Two firewall policies: one for traffic to the tunnel interface and one for traffic from the tunnel interface

To create a VPN on the IBM FortiGate to the local FortiGate:

1. In FortiOS on the IBM FortiGate, go to *VPN > IPsec Wizard*.
2. On the *VPN Setup* tab, configure the following:
 - a. In the *Name* field, enter the desired name.
 - b. For *Template Type*, select *Site to Site*.
 - c. For *Remote Device Type*, select *FortiGate*.
 - d. For *NAT Configuration*, select *This site is behind NAT*. This is the correct configuration since the IBM FortiGate has an floating IP address. Click *Next*.
3. On the *Authentication* tab, configure the following:
 - a. For *Incoming Interface*, select the WAN-facing incoming interface. In this example, it is port1.
 - b. For *Authentication Method*, select *Pre-shared Key*.
 - c. In the *Pre-shared Key* field, enter the same key configured on the local FortiGate. Click *Next*.
4. On the *Policy & Routing* tab, configure the following:
 - a. For *Local Interface*, select the desired local interface. In this example, port2 is selected. The *Local Subnets* field should then autopopulate.
 - b. In the *Remote Subnets* field, enter the remote subnet on the other side of the local FortiGate. In this example, it is 10.1.100.0/24.
 - c. For *Internet Access*, select *None*.
5. Click *Create*. The IPsec Wizard creates the following:
 - Firewall addresses for local and remote subnets
 - Firewall address groups containing the above firewall addresses
 - phase-1 and phase-2 interfaces
 - Static route and blackhole route
 - Two firewall policies: one for traffic to the tunnel interface and one for traffic from the tunnel interface

To establish a connection between the FortiGates:

1. The tunnels are down until you initiate a connection from the local FortiGate to the IBM FortiGate. In FortiOS on the local FortiGate, go to *Dashboard > Network* and click IPsec to expand the widget.
2. Right-click the phase-2 interface, and select *Bring Up > All Phase 2 Selectors*.
3. In FortiOS on the IBM FortiGate, go to *VPN > IPsec Tunnels* and verify that the connection is up.



The screenshot shows the FortiGate VM64-IBM interface for IPsec Tunnels. The left sidebar contains navigation options: Dashboard, Security Fabric, Network, System, and Policy & Objects. The main content area has a search bar and a table with columns: Tunnel, Interface Binding, Status, and Ref. The table lists a tunnel named 'Dialup - FortiGate' with interface binding 'port1', status '1 dialup connection(s)', and a reference '3'. Below the table, there is a '+ toPremise' button.

Tunnel	Interface Binding	Status	Ref.
Dialup - FortiGate	port1	1 dialup connection(s)	3



The floating IP address can be considered as one to one to the FortiGate's IP address, even though the port IP address may be an internal IP address.

Change log

Date	Change Description
2020-07-30	Initial release.
2020-08-04	Added Security Fabric Connector integration with IBM Cloud on page 12.
2020-08-27	Added Connecting a local FortiGate to an IBM Cloud FortiGate via site-to-site VPN on page 20.
2020-10-01	Added Connecting a FortiGate to an IBM Cloud VPC VPN on page 16.



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