



# OCI Deployment Guide

FortiMail 7.4.0



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FortiMail 7.4.0 OCI Deployment Guide

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## Change Log

Date	Change Description
2024-10-23	Initial release of FortiMail 7.4.0 OCI Deployment Guide

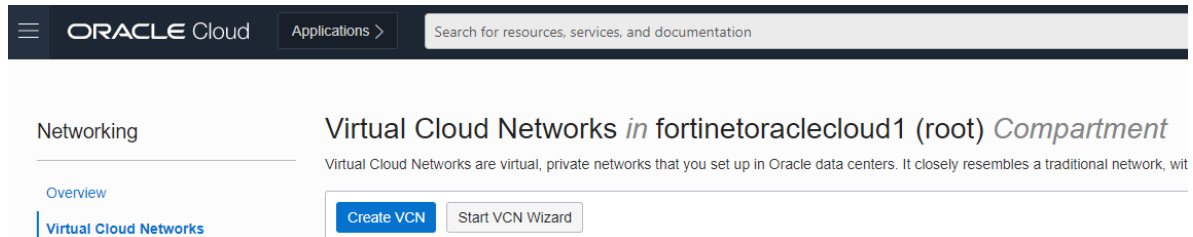
# Introduction

This document describes how to deploy FortiMail VM on Oracle Cloud Infrastructure (OCI). Note that some company or product related information is hidden on purpose in the screen captures.

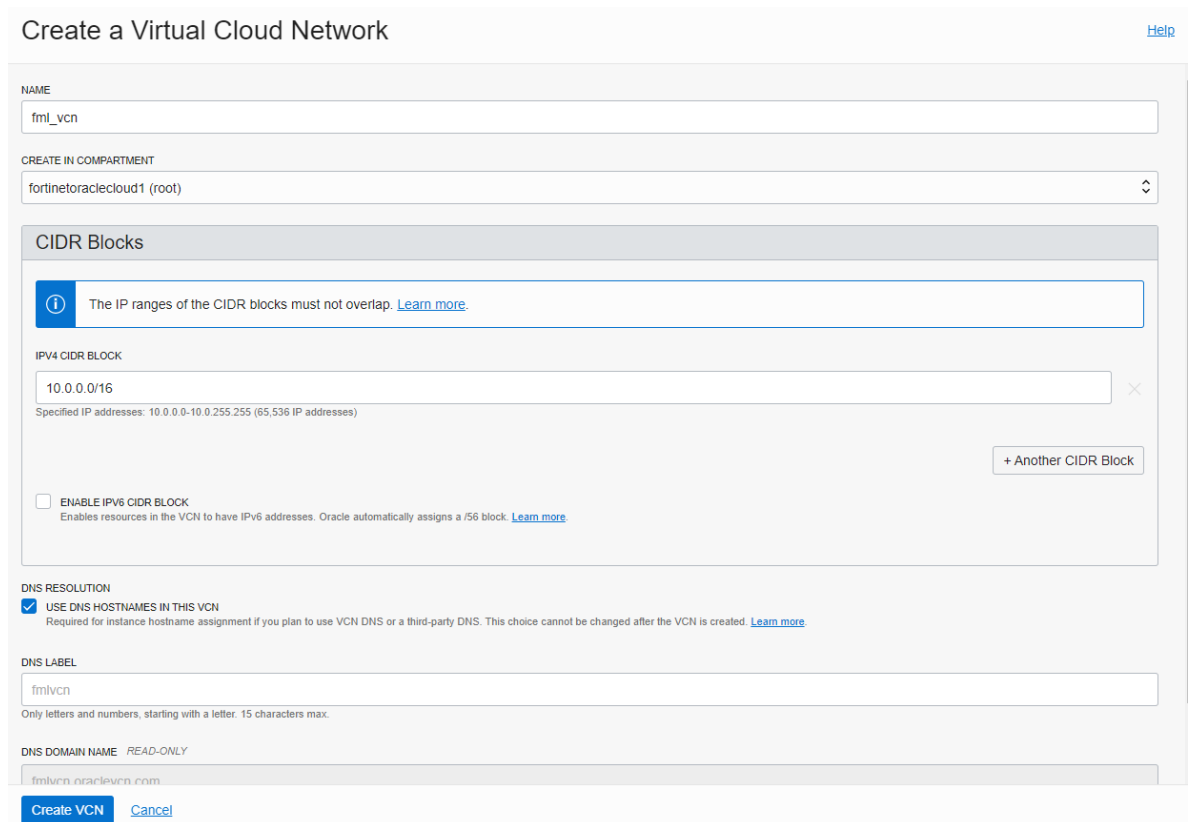
For details about how to use FortiMail, see the FortiMail Administration Guide on <https://docs.fortinet.com>.

# Creating a Virtual Cloud Network and Public-facing Subnet

1. In OCI, go to **Networking > Virtual Cloud Networks**, and click **Create Virtual Cloud Network**.



2. Enter the **NAME** and **IPV4 CIDR BLOCK**, then **Create VCN**.



3. In the **VCN details** page, create a public-facing subnet.

- When creating the subnet, choose **SUBNET TYPE** as **Regional** and **SUBNET ACCESS** as **Public Subnet**.

- Leave **ROUTE TABLE**, **DHCP OPTIONS**, and **SECURITY LIST** as default, and you will need to modify them later.

DNS LABEL

Only letters and numbers, starting with a letter. 15 characters max.

DNS DOMAIN NAME READ-ONLY

DHCP OPTIONS COMPARTMENT IN FORTINETORACLECLOUD1 (ROOT) [\(CHANGE COMPARTMENT\)](#)

**Security Lists**

You can associate up to 5 network security lists with the subnet.

SECURITY LIST COMPARTMENT IN FORTINETORACLECLOUD1 (ROOT) [\(CHANGE COMPARTMENT\)](#)


[+ Another Security List](#)

[Show Tagging Options](#)

[Create Subnet](#) [Cancel](#)

- To access FortiMail with HTTPS, add an **Ingress Rule** in **Default Security List**. You will see that three rules are set up by default, including port 22 for SSH access. There would be more ports needed for later testing, such as port 25 for SMTP, and you can always add or modify these rules later.

Networking » Virtual Cloud Networks » fml\_vcn » Security List Details Subnet provisioning successfully initiated.



### Default Security List for fml\_vcn

Instance traffic is controlled by firewall rules on each Instance in addition to this Security List

[Move Resource](#) [Add Tags](#) [Terminate](#)

Security List Information Tags

**OCID:** ...3xwjq [Show](#) [Copy](#) **Compartment:** fortinetoraclecloud1 (root)

**Created:** Wed, Apr 21, 2021, 06:11:07 UTC

Resources

[Ingress Rules \(3\)](#)

[Egress Rules \(1\)](#)

### Ingress Rules

[Add Ingress Rules](#) [Edit](#) [Remove](#)

<input type="checkbox"/>	Stateless	Source	IP Protocol	Source Port Range	Destination Port Range	Type and Code	Allows
<input type="checkbox"/>	No	0.0.0.0/0	TCP	All	22		TCP traffic for ports: 22 SSH Remote Login Protocol
<input type="checkbox"/>	No	0.0.0.0/0	ICMP			3, 4	ICMP traffic for: 3, 4 Destination Unreachable: Fragmentation Needed and Don't Fragment was Set
<input type="checkbox"/>	No	10.0.0.0/16	ICMP			3	ICMP traffic for: 3 Destination Unreachable

0 Selected

- Add an **Ingress Rule** as below, and set **IP PROTOCOL** as **TCP** and **DESTINATION PORT** as **443**.

**Ingress Rule 1**

Allows TCP traffic 443 HTTPS

STATELESS ⓘ

SOURCE TYPE: CIDR

SOURCE CIDR: 0.0.0.0/0  
Specified IP addresses: 0.0.0.0-255.255.255.255 (4,294,967,296 IP addresses)

IP PROTOCOL: TCP

SOURCE PORT RANGE: All  
Examples: 80, 20-22

DESTINATION PORT RANGE: 443  
Examples: 80, 20-22

DESCRIPTION:   
Maximum 255 characters

8. The Egress Rules are set for **All traffic for all ports**, and there is no need to modify it.

Resources

**Egress Rules**


Add Egress Rules Edit Remove

<input type="checkbox"/>	Stateless	Destination	IP Protocol	Source Port Range	Destination Port Range	Type and Code	Allows	Description
<input type="checkbox"/>	No	0.0.0.0/0	All Protocols				All traffic for all ports	

0 Selected Showing 1 item < 1 of 1 >

9. Create an **Internet Gateway** for your VCN.

Networking > Virtual Cloud Networks > Virtual Cloud Network Details > Internet Gateways



**fml\_vcn**

Move Resource Add Tags Terminate

VCN Information Tags

Compartment: fortinetoraclecloud1 (root)  
 Created: Wed, Apr 21, 2021, 06:11:07 UTC  
 IPv4 CIDR Block: 10.0.0.0/16  
 IPv6 CIDR Block: No Value

OCID: ...5qr4sa Show Copy  
 DNS Resolver: fml\_vcn  
 Default Route Table: Default Route Table for fml\_vcn  
 DNS Domain Name: fmlvcn.oraclevcn.com

Resources

Subnets (1)  
 CIDR Blocks (1)  
 Route Tables (1)  
**Internet Gateways (0)**  
 Dynamic Routing Gateways (0)

**Internet Gateways in fortinetoraclecloud1 (root) Compartment**

Create Internet Gateway

Name	State	Created
No items found.		

Create Internet Gateway [Help](#) [Cancel](#)

---

NAME

CREATE IN COMPARTMENT

Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values that can be attached to resources.  
[Learn more about tagging](#)

TAG NAMESPACE TAG KEY VALUE

×

[+ Additional Tag](#)


[Create Internet Gateway](#) [Cancel](#)

**10. Add a Route Rule for the Default Route Table.**

[Networking](#) » [Virtual Cloud Networks](#) » [fml\\_vcn](#) » Route Table Details

## Default Route Table for fml\_vcn

Move Resource
Add Tags
Terminate



AVAILABLE

Route Table Information Tags

**OCID:** ...s7666q [Show](#) [Copy](#)

**Created:** Wed, Apr 21, 2021, 06:11:07 UTC

Resources

[Route Rules \(0\)](#)

### Route Rules

Add Route Rules
Edit
Remove

	Destination	Target Type
0 Selected		

**11. Choose TARGET TYPE as Internet Gateway, and choose the gateway you just created, and you can set DESTINATION CIDR BLOCK as 0.0.0.0/0 for all.**

## Add Route Rules

[Help](#)

**Important:**  
For a route rule that targets a Private IP, you must first enable "Skip Source/Destination Check" on the VNIC that the Private IP is assigned to.

**Route Rule**

TARGET TYPE  
Internet Gateway

DESTINATION CIDR BLOCK  
0.0.0.0/0  
Specified IP addresses: 0.0.0.0-255.255.255.255 (4,294,967,296 IP addresses)

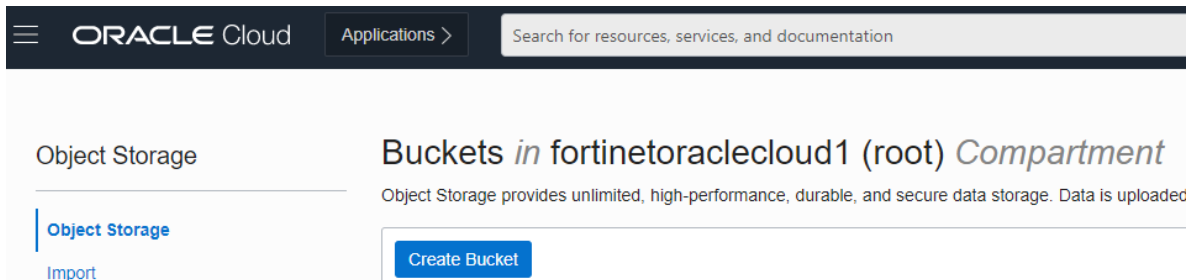
TARGET INTERNET GATEWAY IN FORTINETORACLECLOUD1 (ROOT) [\(CHANGE COMPARTMENT\)](#)  
fml\_vcn-gateway

DESCRIPTION OPTIONAL  
  
Maximum 255 characters

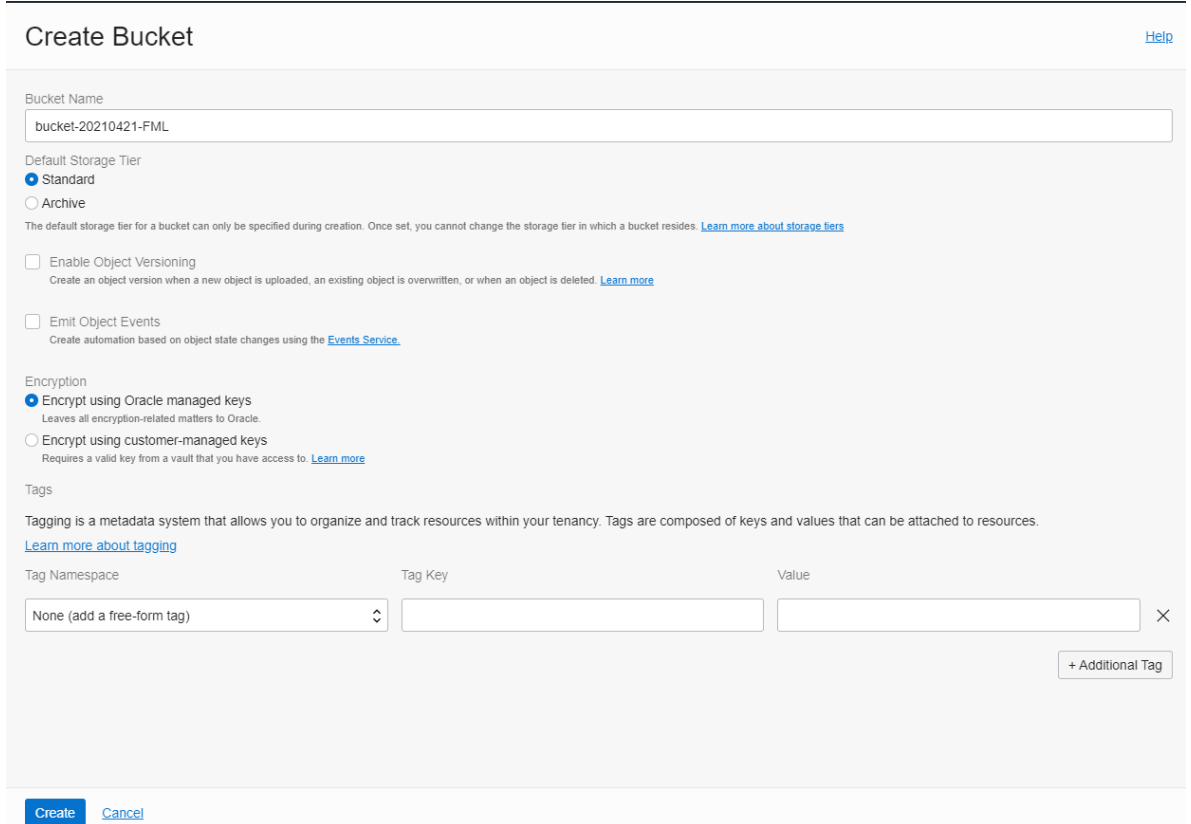
+ Another Route Rule

# Creating a FortiMail VM Instance

1. Go to <https://support.fortinet.com> and download the FortiMail VM image FML\_VMOC-64-vxx-build0xxx-FORTINET.out.openxen.zip file. Unzip it to get the 'fortimail-opc.qcow2' file, which is needed to deploy FortiMail on OCI.
2. On OCI, go to Object Storage, then click Create Bucket to create a standard storage bucket.



3. You can create the bucket with default settings.



4. Click into the bucket you just created and upload the \*.qcow2 file to **Objects**.

Object Storage » Bucket Details

## bucket-20210421-FML

Edit Visibility
Move Resource
Re-encrypt
Add Tags
Delete

Bucket Information

**Visibility:** Private  
**Namespace:** fortinetoraclecloud1  
**Default Storage Tier:** Standard  
**Approximate Count:** 0 objects ⓘ  
**ETag:** b5e06036-c049-450a-a6d0-52c6780a4e8e  
**OCID:** ...i2i6hooa Show Copy

Resources

- Objects**
- Metrics
- Pre-Authenticated Requests

Objects

Upload
More Actions

<input type="checkbox"/>	Name	Last Modified
--------------------------	------	---------------

### Upload Objects

Object Name Prefix *Optional*

FML\_v70116\_image

Storage Tier

Standard

Choose Files from your Computer

Drop files here or [select files](#)

fortimail-opc.qcow2 108.38 MiB

1 files, 108.38 MiB total

Show Optional Response Headers and Metadata

- After the image file is uploaded, create a **Pre-Authenticated Request**.

### Resources

- Objects
- Metrics
- Pre-Authenticated Requests
- Work Requests

## Pre-Authenticated Requests

Create Pre-Authenticated Request

Name	Status	Target

### Create Pre-Authenticated Request [Help](#)

Name

Pre-Authenticated Request Target

**Bucket**

Create a pre-authenticated request that applies to all objects in the bucket.

**Object**

Create a pre-authenticated request that applies to a specific object. ✓

**Objects with prefix**

Create a pre-authenticated request that applies to all objects with a specific prefix.

Object Name

Access Type

Permit object reads

Permit object writes

Permit object reads and writes

Expiration

- After the request is created, you will see the details window. Copy and save this URL, which will be used in later steps.

### Pre-Authenticated Request Details

Name *Read-Only*

Pre-Authenticated Request URL *Read-Only*

!

Copy this URL for your records. It will not be shown again.

Close

- Go to **Compute > Custom Images**. Click **Import Image**. Choose **Import from an Object Storage URL** and paste the previous URL. Under **IMAGE TYPE**, select **QCOW2**. Under **LAUNCH MODE**, select **PARAVIRTUALIZED MODE** or **EMULATED MODE**. Native mode is not supported.

### Import Image [Help](#)

Create in compartment  
fortinetoracled1 (root)

Name  
fml-v70116

Operating system  
Linux

Import from an Object Storage bucket  
 Import from an Object Storage URL

Object Storage URL  
 https://objectstorage.us-phoenix-1.oraclecloud.com/p/N7\_aV1CUKWxlGTv8yG6-COAmw8eQEmIPBxDNMjHeAxzR9MDHareGtw3-uQw2Yv1/n/fortinetoracled1/b/bucket-20210421-FML

Learn more about [Object Storage URLs](#). Also, see the instructions to [create a pre-authenticated request](#).

Image type  
 VMDK  
 Virtual machine disk file format. For disk images used in virtual machines.  
 QCOW2  
 For disk image files used by QEMU.  
 OCI  
 For images that were exported from Oracle Cloud Infrastructure. The launch mode is specified in the .oci file and can't be changed in the Console.

Launch mode

**Firmware:** BIOS **NIC attachment type:** PV NIC  
**Boot volume type:** PV **Remote data volume:** PV

Paravirtualized Mode  
 For virtual machines that [support paravirtualized drivers](#), created outside of Oracle Cloud Infrastructure.  
 Emulated Mode  
 For virtual machines that [don't support paravirtualized drivers](#), created outside of Oracle Cloud Infrastructure from older on-premises physical or virtual machines.  
 Native Mode  
 For images that were exported from Oracle Cloud Infrastructure.

8. From the newly imported image, click **Create Instance**. Take note of the **Compatible Shapes**, and make sure to choose a shape from this list in later steps.

Compute > Custom Images > Custom Image Details

fml-v70116-20210421

Custom Image Information Tags

---

**Custom Image Information**

**OCID:** ...bmdna [Show](#) [Copy](#)  
**Original Image:** -  
**Compartment:** fortinetoracled1 (root)

**Launch Mode:** PARAVIRTUALIZED  
**Created:** Wed, Apr 21, 2021, 07:14:15 UTC  
**Compatible VM Shapes:** VM.Standard.E3.Flex, VM.Standard2.1, VM.Standard2.2, VM.Standard2.4, VM.Standard2.8, VM.Standard2.16, VM.Standard2.24, VM.Standard1.1, VM.Standard1.2, VM.Standard1.4, VM.Standard1.8, VM.Standard1.16  
**Flex Shape Requirements:** 1 OCPU minimum, 64 OCPU maximum

**Launch Options**  
 Launch options include the networking type and boot volume attachment type used when launching a virtual machine instance. [Learn more](#)

**NIC Attachment Type:** PARAVIRTUALIZED **Firmware:** BIOS  
**Remote Data Volume:** PARAVIRTUALIZED **Boot Volume Type:** PARAVIRTUALIZED

9. You can choose either **Availability domain** and keep the advanced options as default.

## Create Compute Instance

Create an instance to deploy and run applications, or save as a reusable Terraform stack for creating an instance with Resource Manager.

Name  
fml-20210421-v70116

Create in compartment  
fortinetoraclecloud1 (root)

**Placement** [Collapse](#)

The [availability domain](#) helps determine which shapes are available.

Availability domain

AD 1 wwwf:PHX-AD-1 ✓	AD 2 wwwf:PHX-AD-2	AD 3 wwwf:PHX-AD-3
-------------------------	-----------------------	-----------------------

[Hide advanced options](#)

Capacity type

- On-demand capacity  
Place the instance on a shared host using on-demand capacity.
- Preemptible capacity  
Place the instance on a shared host using [preemptible capacity](#). This instance can be reclaimed at any time.
- Capacity reservation  
Place the instance on a shared host, and have it count against a [capacity reservation](#).
- Dedicated host  
Place the instance on a [dedicated virtual machine host](#).

Fault Domain  
Let Oracle choose the best fault domain

[When should I specify a fault domain?](#)

10. Image and shape are chosen automatically. You can modify the shape as desired.


**Image and shape** [Collapse](#)

A [shape](#) is a template that determines the number of CPUs, amount of memory, and other resources allocated to an instance. The image is the operating system that runs on top of the shape.

Image

fml-v70116-20210421 [Change Image](#)

Shape

 VM.Standard.E3.Flex  
Virtual Machine, 1 core OCPU, 16 GB memory, 1 Gbps network bandwidth [Change Shape](#)

11. Choose your VCN and its public subnet. For public access to FortiMail, you must assign a public IPV4 address.

### Networking [Collapse](#)

[Networking](#) is how your instance connects to the internet and other resources in the Console. To make sure you can [connect to your instance](#), assign a public IP address to the instance.

**Network**  
 Select existing virtual cloud network    Create new virtual cloud network    Enter subnet OCID

Virtual cloud network in **fortinetoracled1 (root)** ([Change Compartment](#))

**Subnet**  
 Select existing subnet    Create new public subnet

Subnet in **fortinetoracled1 (root)** ([Change Compartment](#))

**Public IP Address**  
 Assign a public IPv4 address    Do not assign a public IPv4 address

! Assigning a public IP address makes this instance accessible from the internet. If you're not sure whether you need a public IP address, you can always assign one later.

[Show advanced options](#)

12. Click **Generate SSH key pair and Save Private Key**. The private key will be used for SSH accessing. You can also paste your own SSH public key or skip this step for now. Specify the customer boot volume size as minimum 50GB.

### Add SSH keys

Linux-based instances use an [SSH key pair](#) instead of a password to authenticate remote users. Generate a key pair or upload your own public key now. When you [connect to the instance](#), you will provide the associated private key.

Generate SSH key pair    Upload public key files (.pub)    Paste public keys    No SSH keys

! Download the private key so that you can connect to the instance using SSH. It will not be shown again.

### Boot volume

Your [boot volume](#) is a detachable device that contains the image used to boot your compute instance.

Specify a custom boot volume size  
[Volume performance](#) varies with volume size. Default boot volume size: 46.6 GB

Boot volume size (GB)

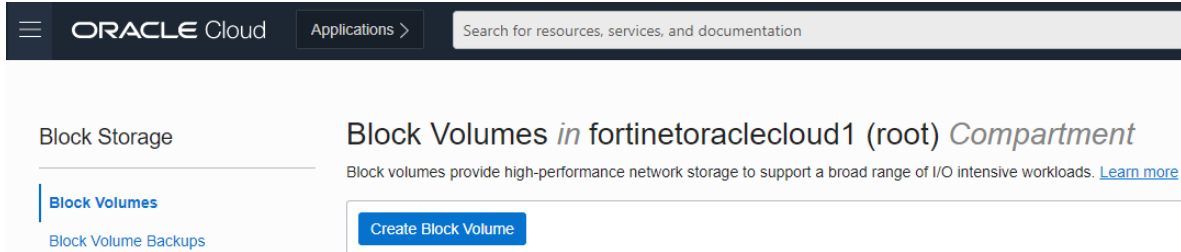
Integer between 50 GB and 32,768 GB (32 TB). Must be larger than the default boot volume size for the selected image.

Encrypt this volume with a key that you manage  
By default, Oracle manages the keys that encrypt this volume, but you can choose a key from a vault that you have access to if you want greater control over the key's lifecycle and how it's used. [Learn more about managing your own encryption keys](#)

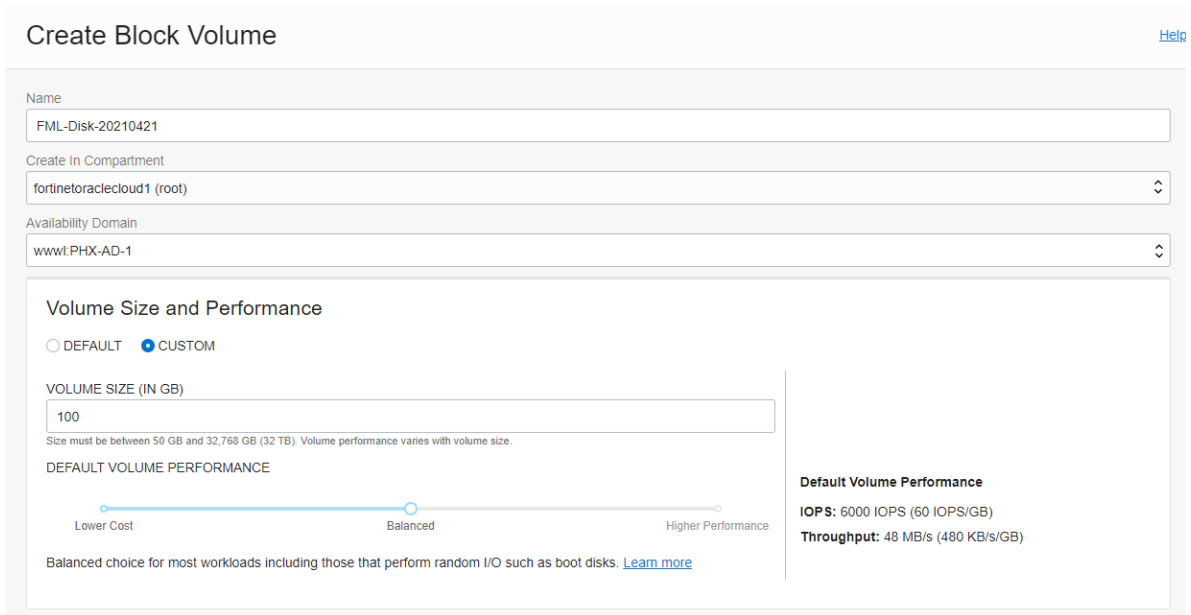
At this stage, the deployment is not complete yet. You also need to add a storage volume as a system log disk and attach it to the FortiMail instance. If you want FortiMail to run inline across two or multiple subnets, you will also need to add one or more virtual network interfaces and attach them to the FortiMail instance.

# Attaching Storage to FortiMail

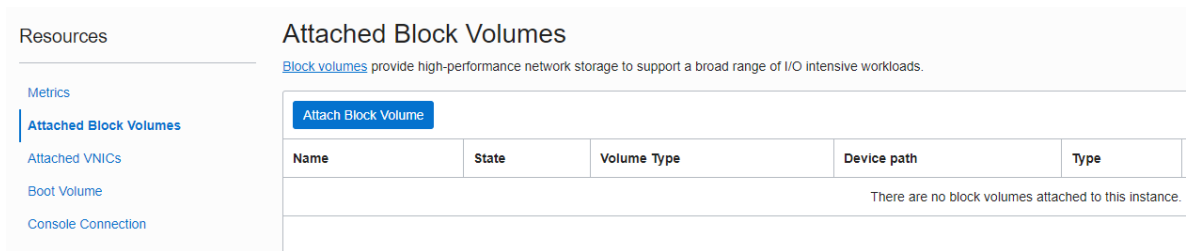
1. On OCI, go to **Storage > Block Volumes > Create Block Volume**.



2. Make sure the **Availability Domain** is the same as your instance, and customize a smaller volume size, for example, 100 GB. Keep other settings as default.



3. Once provisioned, return to the FortiMail instance. Click **Attach Block Volume**.



4. Select the block volume that you created earlier and ensure the attachment type is **Paravirtualized**.

### Attach Block Volume [Help](#)

Volume attachment type

Let Oracle Cloud Infrastructure choose the best attachment type

iSCSI

Paravirtualized

Use in-transit encryption

#### Volume

Select volume  Enter volume OCID

Volume in **fortinetoracledcloud1 (root)** [\(Change Compartment\)](#)

FML-Disk-20210421

Access

Read/Write  
Configures the volume attachment as read/write, not shared with other instances. This enables attachment to a single instance only and is the default configuration.

Read/Write - Shareable  
Configures the volume attachment as read/write, shareable with other instances. This enables read/write attachment to multiple instances.

Read Only - Shareable  
Configures the volume attachment as read-only, enabling attachment to multiple instances.



After attaching the block volume, make sure to reboot the FortiMail instance.

---

# Accessing FortiMail

1. In the FortiMail instance detail page, you will find the public IP address and the OCID. In a web browser, you can access FortiMail with `https://<public_IP_address>/admin`, and the initial username/password is 'admin/OCID'.

fml-20210421-v70116

Start Stop Reboot Edit More Actions

Instance Information Oracle Cloud Agent Tags

### General Information

**Availability Domain:** AD-1  
**Fault Domain:** FD-1  
**Region:** phx  
**OCID:** [REDACTED] [Hide](#) [Copy](#)  
**Launched:** Wed, Apr 21, 2021, 14:34:26 UTC  
**Compartment:** fortinetoraclecloud1 (root)  
**Capacity type:** On-demand

### Instance Details

**Virtual Cloud Network:** [fml\\_vcn](#)  
**Maintenance Reboot:** -  
**Image:** [fml-v70116-20210421](#)  
**Launch Mode:** PARAVIRTUALIZED  
**Instance Metadata Service:** Versions 1 and 2 [Edit](#) ⓘ  
**Maintenance Recovery Action:** Restore instance

### Shape Configuration

**Shape:** VM.Standard.E3.Flex  
**OCPU Count:** 1  
**Network Bandwidth (Gbps):** 1

### Instance Access

We're not quite sure how to connect to an instance that uses this image. Refer to the image's documentation, or see the general steps to [connect to a running instance](#).

**Public IP Address:** [REDACTED] [Copy](#)

### Primary VNIC

**Private IP Address:** 10.0.0.221  
**Network Security Groups:** None [Edit](#) ⓘ  
**Subnet:** [fml\\_vcn\\_public\\_sub](#)  
**Internal FQDN:** fml-20210421-v70116... [Show](#) [Copy](#)

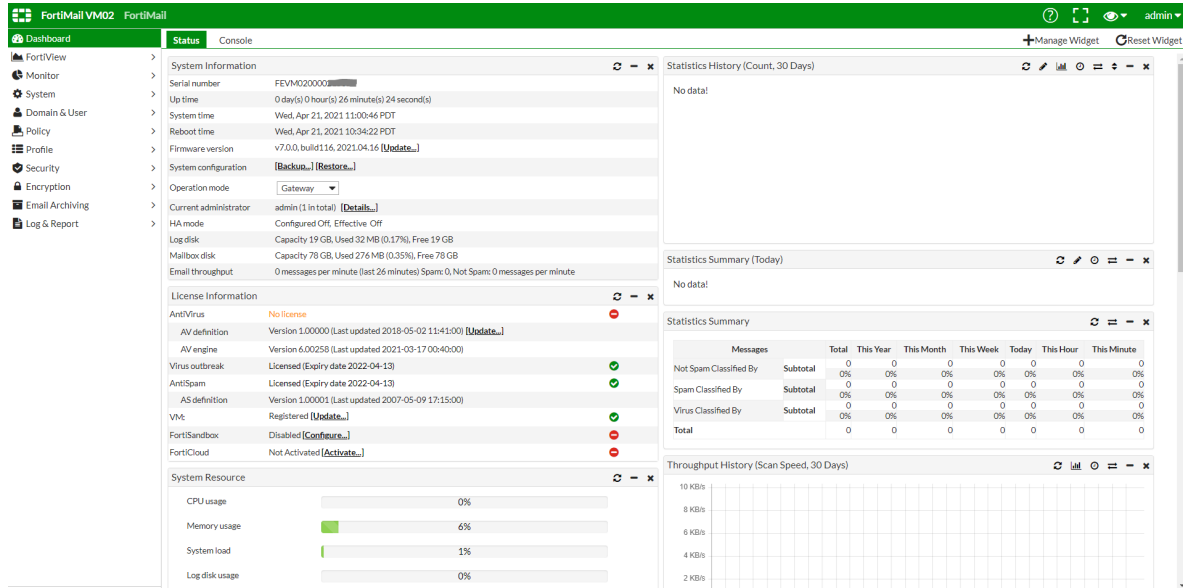
### Launch Options

**NIC Attachment Type:** PARAVIRTUALIZED  
**Remote Data Volume:** PARAVIRTUALIZED  
**Firmware:** BIOS  
**Boot Volume Type:** PARAVIRTUALIZED  
**In-transit Encryption:** Disabled

2. At the first time login, you will be forced to change your password.



- The last step is to upload a valid FML VM license, and then you should be able to see the FortiMail Admin GUI.



- For further testing on this FortiMail instance, you may need to add more rules in **Security List**. For example, a rule to open port 25 is necessary for SMTP testing.

Add Ingress Rules [Cancel](#)

---

**Ingress Rule 1**

Allows TCP traffic 25 Simple Mail Transfer Protocol (SMTP)

STATELESS ⓘ

SOURCE TYPE: CIDR SOURCE CIDR: 0.0.0.0/0 IP PROTOCOL ⓘ: TCP

Specified IP addresses: 0.0.0.0-255.255.255.255 (4,294,967,296 IP addresses)

SOURCE PORT RANGE OPTIONAL ⓘ: All DESTINATION PORT RANGE OPTIONAL ⓘ: 25

Examples: 80, 20-22 Examples: 80, 20-22

DESCRIPTION OPTIONAL ⓘ

Maximum 255 characters

[+ Another Ingress Rule](#)

