

# Flex Shapes on the Oracle Private Cloud Appliance

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## **Purpose statement**

The document summarizes how you can utilize Flex Shapes while launching a Virtual Machine instance on the Oracle Private Cloud Appliance.

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## Table of contents

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<b>INTRODUCTION</b>	<b>4</b>
<b>SCOPE AND CONTENT</b>	<b>4</b>
<b>ADVANTAGES OF ORACLE PRIVATE CLOUD APPLIANCE</b>	<b>4</b>
<b>HOW TO USE FLEX SHAPES</b>	<b>5</b>
<b>Compute Enclave Console (CEUI)</b>	<b>5</b>
<b>Terraform Code Block</b>	<b>7</b>
<b>Fault Domain Observability via Admin Console UI:</b>	<b>9</b>
<b>UPDATING SHAPES</b>	<b>10</b>
<b>Terminate Standard Shape Instance with Preserving Boot Volume</b>	<b>10</b>
<b>CONCLUSION</b>	<b>11</b>
<b>RESOURCES</b>	<b>12</b>

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## INTRODUCTION

Oracle Private Cloud Appliance (PCA) is the best on-premises platform for application and middleware, providing you with high scalability, performance, and availability for crucial. Oracle Private Cloud Appliance has the same infrastructure constructs with APIs and SDKs compatible with OCI. This enables customers to adopt a “Develop Once, Deploy Anywhere” approach to rapidly design and develop high performance applications and middleware.

## SCOPE AND CONTENT

This document provides a walkthrough of how customers can deploy and utilize Flex Shapes while deploying virtual machine (VM) instances on Oracle Private Cloud Appliance. As a customer, you can utilize either the Compute Enclave User Interface, OCI CLI or Terraform to deploy flexible shapes. The instructions to deploy flex shapes in this document are applicable to:

- Oracle Private Cloud Appliance X9-2
- Oracle Private Cloud Appliance X10

## ADVANTAGES OF ORACLE PRIVATE CLOUD APPLIANCE

Oracle Private Cloud Appliance is a rack-scale engineered system delivering Oracle Cloud Infrastructure compute, storage and networking constructs on-premises. It enables rapid deployment of applications, middleware and workloads that are cloud- compatible via automation in an OCI-like environment while being disconnected from the public cloud. Oracle Private Cloud Appliance is the ideal platform alongside Oracle Exadata and Oracle Database Appliance platforms offering lowest latency and highest performance between the application and database layers. Oracle Private Cloud Appliance is designed for customers who want a cloud-like development and deployment experience while also meeting data residency requirements

## FLEX SHAPES ON ORACLE PRIVATE CLOUD APPLIANCE

Oracle Private Cloud Appliance Software enables customers to deploy Flex Shapes on-premises to support their virtual instances. A flexible shape lets you customize the number of OCPUs and the amount of memory for an instance. When you update an instance, you can change these properties of the flexible shape, and you can change from a fixed shape to a flexible shape. This flexibility lets you create instances that meet your workload requirements, while optimizing performance and using resources efficiently.

The VM.PCAStandard.E5.Flex shape can be selected only for Oracle Private Cloud Appliance X10 systems.

Shape	OCPUs	Memory (GB)	Maximum VNICS	Maximum Bandwidth (Gbps)
VM.PCA Standard1.Flex	1-32	64 GB maximum per OCPU. 512 GB maximum per instance	64 GB per OCPU, up	1 to 24 OCPUs: 24.6 Gbps 25 to 32 OCPUs: 1 Gbps per OCPU
VM.PCAStandard .E5.Flex	1-968	64 GB maximum per OCPU 960 GB maximum per instance	1 OCPU: 2 VNICS 2 to 24 OCPU:VNIC per OCPU 25 to 96 OCPUs: 24 VNICS	1 to 24 OCPUs: 24.6 Gbps 25 to 40 OCPUs: 1 Gbps per OCPU 41 to 96 OCPUs: 40.0 Gbps

## HOW TO USE FLEX SHAPES

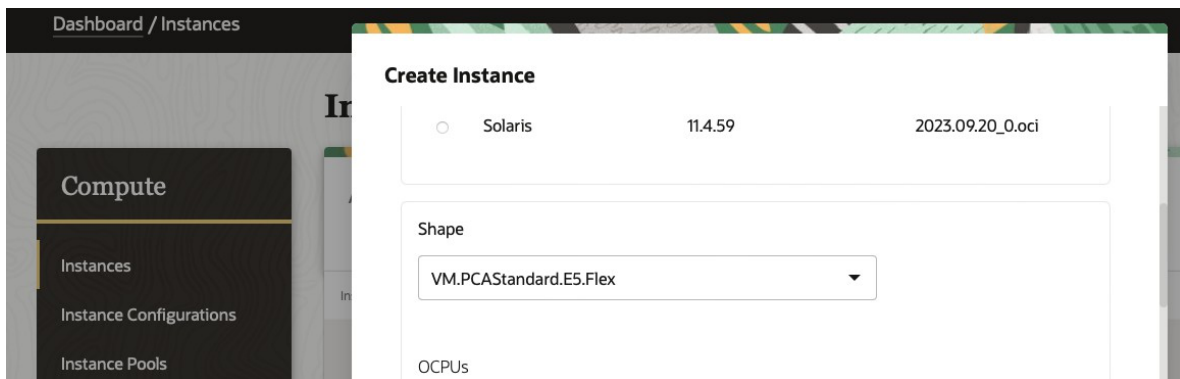
Oracle Private Cloud Appliance Provides multiple ways to create and launch Flex Shape based VMs:

- Compute Enclave Console (CEUI)
- OCI CLI
- Terraform

### Compute Enclave Console (CEUI)

When launching a VM Instance using the Oracle Private Appliance Compute Enclave UI, follow these steps:

- In the Shape Selection dropdown, select VM.PCAStandardE5.Flex or VM.PCAStandard.E5.Flex (\* only Oracle Private Cloud Appliance X10)
- Use the Slider or Text Box, to choose your preferred number of OCPUs and Memory



Compute Enclave Console User Interface with VM.PCAStandard1.Flex configuration **OCI CLI**

- Launch Flexible Shape Instance with shape-config parameter

- When using OCI CLI to launch VM Instances, the OCI CLI instance launch parameter '-shape-config' is required for flexible shapes.

ocpus	Required: yes
memoryInGBs	Required: no
	If null, ocpus * defaultMemoryPerOcpuInGBs memory will be assigned

### Example:

- Copy the following CLI commands into a file named pcaexample.sh.
- Run the command by typing “bash pcaexample.sh” and replacing the example parameters with your own to launch a flex instance with 1xocpus and 16xmemoryInGBs and any other desired OCPUs and the amount of memory:

```
export cidr_block=<substitute-value-of-cidr_block>
export compartment_id=<substitute-value-of-compartment_id>
export availability_domain=<substitute-value-of-availability_domain> export
image_id=<substitute-value-of-image_id>
export bootvolsize=<substitute-value-of-size>
vcn_id=$(oci network vcn create --cidr-block $cidr_block --compartment-id $compartment_id -- query data.id --
raw-output)
subnet_id=$(oci network subnet create --cidr-block $cidr_block --compartment-id
$compartment_id --vcn-id $vcn_id --query data.id --raw-output)
oci compute instance launch --availability-domain $availability_domain --compartment-id
$compartment_id --source-details
'{"bootVolumeSizeInGBs":"$bootvolsize","imageId":"$image_id","sourceType":"image"}' -- shape
VM.PCAStandard1.Flex --subnet-id $subnet_id --shape-config '{"ocpus": 1, "memoryInGBs": 16}' --ssh-authorized-
keys-file <public-ssh-key-file>
```

## Terraform

Terraform example code snippet to launch a flex instance on Oracle Private Cloud Appliance:

- Replace *compartment\_id*, *subnet\_id*, *source\_id* as per your setup

## Terraform Code Block

```
resource "oci_core_instance" "My_Flex_Instance" {
  # Required
  compartment_id = local.Compartment_id
  shape          = "VM.PCAStandard1.Flex"
  # Optional
  availability_domain = "ad1"
  create_vnic_details {
    # Required
    subnet_id = local.Subnet_id
  }
  fault_domain = "FAULT-DOMAIN-1"
  source_details {
    # Required
    source_id = local.Image_Id
    source_type = "image"
  }
  shape_config {
    memory_in_gbs = 16
    ocpus = 1
  }
}
```

## Terraform execution output for flex shape

### # terraform apply --auto-approve

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:

+ create

Terraform will perform the following actions:

# oci\_core\_instance.My\_Flex\_Instance will be created + resource

"oci\_core\_instance" "My\_Flex\_Instance" {

+ availability\_domain = "ad1"

+ compartment\_id =

"ocid1.tenancy.XXXXXX.XXXXXX.gidclawftnq3vo572t4cb46tmqxmalg4aivv7ttoa1a7y0mibcak00090146"

+ fault\_domain = "FAULT-DOMAIN-1"

```

+ shape                                = "VM.PCAStandard1.Flex"
+ create_vnic_details {
    + assign_public_ip                 = "true"
    + subnet_id                         =
"ocid1.subnet.XXXXXX.XXXXXX.g8oals0oczhkxhl2nr1nuldpscia0jhvcsyx4mitl5o81pyqhmbps0c9ltu1"
}
+ shape_config {
    + memory_in_gbs                    = 16
    + ocpus                             = 1
}
+ source_details {
+ source_id =
"ocid1.image.XXXXXX.XXXXXX.xzipie5s2ountsjaomt9qlxb0uffvcr5np9fsgc4ky1m5kqcnlho3ut6wp1g"

    + source_type                       = "image"
}
}

```

Plan: 1 to add, 0 to change, 0 to destroy. oci\_core\_instance.My\_Flex\_Instance:

Creating... oci\_core\_instance.My\_Flex\_Instance: Still creating... [10s elapsed]

oci\_core\_instance.My\_Flex\_Instance: Still creating... [20s elapsed]

oci\_core\_instance.My\_Flex\_Instance: Still creating... [30s elapsed]

oci\_core\_instance.My\_Flex\_Instance: Still creating... [40s elapsed]

oci\_core\_instance.My\_Flex\_Instance: Creation complete after 47s

[id=ocid1.instance.XXXXXX.XXXXXX.i38gl920b5rm1wvtpeioqphvx0ls25i2sf15lna8uqtq8rw0cmz8r4pbd2w6]

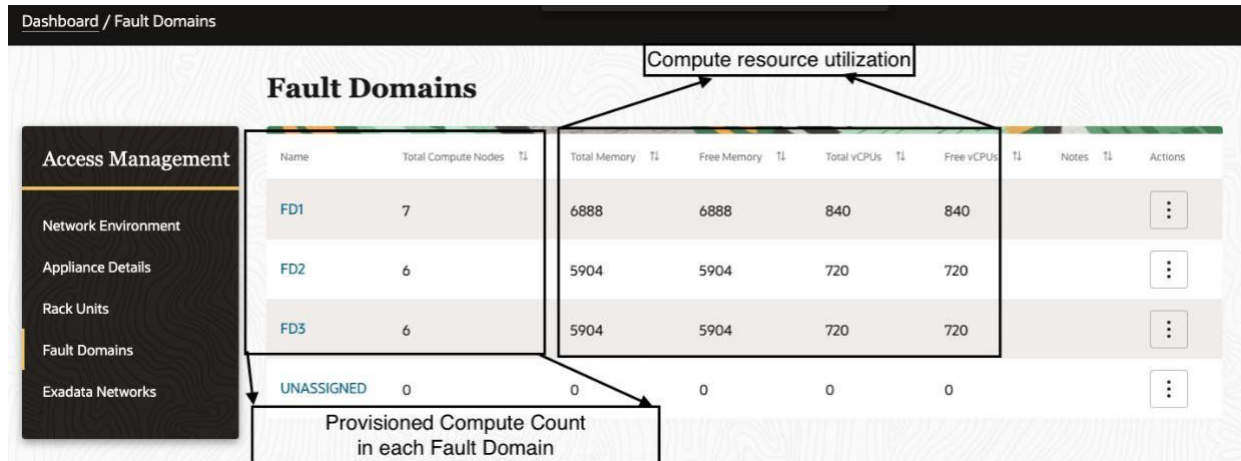
Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

## Monitoring

Oracle Private Cloud Appliance provides a monitoring capability of the OCPUs and the amount of memory via Fault Domain Observability feature via Admin Console UI and Admin CLI.



### Fault Domain Observability via Admin Console UI:



Fault Domain Observability providing monitoring capability

Fault Domain Observability providing monitoring capability of the OCPUs

### Fault Domain Observability via Admin CLI

```

PCA-ADMIN> getFaultDomainInfo
Command: getFaultDomainInfo
Status: Success
Time: 2024-02-28 13:12:42,762 UTC
Data:
  id          totalCNs  totalMemory  freeMemor  totalvCPUs  freevCPUs  notes
             y
  --          -
UNASSIGN    0         0.0          0.0        0           0
ED
FD1         7         6888.0       6888.0     840         840
FD2         6         5904.0       5904.0     720         720
FD3         6         5904.0       5904.0     720         720
    
```

### Flex Shape Instance GET Output

**oci compute instance get --instance-id**

```
oci compute instance get --instance-id
ocid1.instance.XXXX.XXXX.73yexeo36yobhavg6qjr9cjghi2gde6q0kghisyjwqum2salk1ceojeata0s |
grep VM.PCAStandard1.Flex -A12 | grep -v null
```

Warning: Python 3.6 is deprecated and will not be supported by cryptography in the future "shape":

```
"VM.PCAStandard1.Flex",
"shape-config": {
  "max-vnic-attachments": 2,
```

**UPDATING SHAPES**

Updating the shape requires terminating the instance while preserving boot volumes and then re-launching the instance, using boot volume as source and using the Flex shape.

**Terminate Standard Shape Instance with Preserving Boot Volume**

```
export cidr_block=<substitute-value-of-cidr_block>
export compartment_id=<substitute-value-of-compartment_id>
export availability_domain=<substitute-value-of-availability_domain> export
image_id=<substitute-value-of-image_id>

export sourcebootvolumeid =<substitute-value-of-sourcebootvolumeid-for-terminated-instance>
vcn_id=$(oci network vcn create --cidr-block $cidr_block --compartment-id $compartment_id -- query
data.id --raw-output)
subnet_id=$(oci network subnet create --cidr-block $cidr_block --compartment-id
$compartment_id --vcn-id $vcn_id --query data.id --raw-output)
oci compute instance launch --availability-domain $availability_domain --compartment-id
$compartment_id --source-boot-volume-id $sourcebootvolumeid --shape VM.PCAStandard1.Flex -- subnet-id
$subnet_id --shape-config '{"opus": 1, "memoryInGBs": 16}' --ssh-authorized-keys- file <SSH Public
Key> --wait-for-state RUNNING
```

```

export cidr_block=<substitute-value-of-cidr_block>
export compartment_id=<substitute-value-of-compartment_id>
export availability_domain=<substitute-value-of-availability_domain>
export image_id=<substitute-value-of-image_id>
export bootvolsize=<substitute-value-of-size>
vcn_id=$(oci network vcn create --cidr-block $cidr_block --compartment-id $compartment_id --
query data.id --raw-output)
subnet_id=$(oci network subnet create --cidr-block $cidr_block --compartment-id
$compartment_id --vcn-id $vcn_id --query data.id --raw-output)
instance_id=$(oci compute instance launch --availability-domain $availability_domain --
compartment-id $compartment_id --source-details
'{"bootVolumeSizeInGBs": "$bootvolsize", "imageId": "$image_id", "sourceType": "image"}' --
shape VM.PCAStandard1.2 --wait-for-state RUNNING --subnet-id $subnet_id --ssh-authorized-keys-
file <SSH Public Key> --query data.id --raw-output)
oci compute instance terminate --instance-id $instance_id --preserve-boot-volume true

```

```

export cidr_block=<substitute-value-of-cidr_block>
export compartment_id=<substitute-value-of-compartment_id>
export availability_domain=<substitute-value-of-availability_domain> export
image_id=<substitute-value-of-image_id>
export sourcebootvolumeid =<substitute-value-of-sourcebootvolumeid-for-terminated-instance>
vcn_id=$(oci network vcn create --cidr-block $cidr_block --compartment-id $compartment_id -- query
data.id --raw-output)
subnet_id=$(oci network subnet create --cidr-block $cidr_block --compartment-id
$compartment_id --vcn-id $vcn_id --query data.id --raw-output)
oci compute instance launch --availability-domain $availability_domain --compartment-id
$compartment_id --source-boot-volume-id $sourcebootvolumeid --shape VM.PCAStandard1.Flex -- subnet-
id $subnet_id --shape-config '{"ocpus": 1, "memoryInGBs": 16}' --ssh-authorized-keys- file <SSH
Public Key> --wait-for-state RUNNING

```

## Relaunch Instance with Flex Shape

**Note:** Users can use same subnet and different flex shape setting as per their requirements and needs

## CONCLUSION

Following the above steps, Oracle Private Cloud Appliance customers can now choose Flex Shapes while configuring their VM instances.

## RESOURCES

See these reference documents for additional information:

- [Oracle Private Cloud Appliance Release Notes](#)
- [Oracle Systems Blog](#)

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