



Flex Shapes on the Oracle Private Cloud Appliance

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. Flex Shapes are available upon upgrading to Oracle Private Appliance Software Release 3.0.1. **b741265.**

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INTRODUCTION

Oracle Private Cloud Appliance (PCA) is the only Oracle Cloud Infrastructure (OCI) compatible Engineered System, providing fast and efficient infrastructure for modern software and business applications. PCA 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.

ADVANTAGES OF ORACLE PRIVATE CLOUD APPLIANCE

Oracle Private Cloud Appliance (PCA) is an Oracle Engineered System designed for implementing the application and middleware tiers. PCA is an integrated hardware and software system that reduces infrastructure complexity and deployment time for virtualized workloads in private clouds. It is a complete platform for a wide range of application types and workloads, with built-in management, compute, storage, and networking resources. PCA provides excellent performance and other system properties for hosting a broad range of applications.

Oracle Private Cloud Appliance X9-2 is the latest member of the Oracle Private Cloud Appliance product family. PCA provides cloud and administrative services for a supporting range of workloads including modernized cloud native applications. It makes use of a modern microservices architecture, Kubernetes, and related technologies, for a future-proofed software stack.

A key new feature of PCA X9-2 compared to previous PCA versions, is that it delivers private cloud infrastructure and architecture consistent with Oracle Cloud Infrastructure (OCI). PCA brings APIs and SDKs compatible with Oracle Cloud Infrastructure (OCI) to an on-premises implementation at rack scale, making workloads, user experience, tool sets and skills portable between private and public clouds. PCA can be paired with Oracle Exadata to create an ideal infrastructure for scalable, multi-tier applications. Customers preferring or requiring an on-premises solution can realize the operational benefits of public cloud deployments using Oracle Private Cloud Appliance X9-2.

FLEX SHAPES ON ORACLE PRIVATE CLOUD APPLIANCE

With the release of Oracle Private Cloud Appliance Software Version 3.0.1, Oracle Private Cloud Appliance customers can now deploy Flex Shapes to support their VM Instances. Flex Shapes provides users the flexibility to customize the number of OCPUs and the amount of memory when launching a VM instance as per their workload requirements.

These flexible shapes are based on Oracle Server X9-2 Compute powered by 2 Intel® Xeon® P8358 with 32 cores per socket Intel's processors. Oracle PCA Server X9-2 provides the optimal balance of cores, memory, and I/O throughput for enterprise applications.

SHAPE	OCPUS	MINIMUM MEMORY	MAXIMUM MEMORY	MAXIMUM VNICS
VM.PCAStandard1.Flex	1 - 32	1 GB or a value matching the number of OCPUs, whichever is greater	64 GB per OCPU, up to 512 GB per instance	1 OCPU: 2 VNICS 2 to 24 OCPUs: 1 VNIC per OCPU 25 to 32 OCPUs: 24 VNICS

HOW TO USE FLEX SHAPES

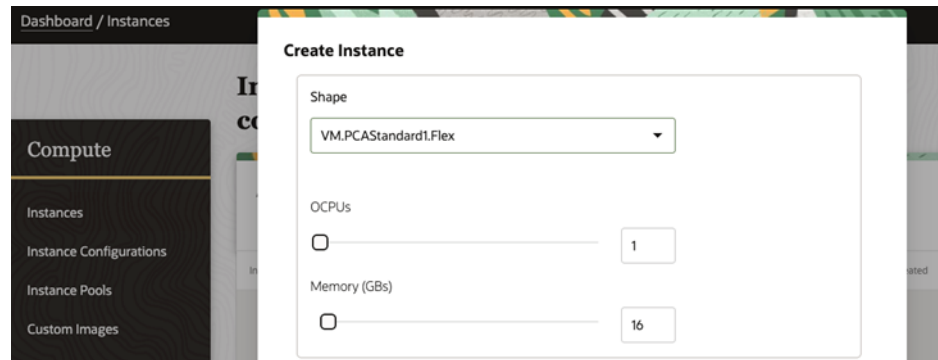
Oracle Private Cloud Appliance Provides multiple ways to create and launch Flex Shape based VMs:

- 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.PCAStandard1.Flex
- 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.gidclawftnq3vo572t4cb46tmqxmalg4aivv7tto1a1a7y0mibcak00090146"
  + fault_domain            = "FAULT-DOMAIN-1"
  + shape                   = "VM.PCAStandard1.Flex"
  + create_vnic_details {

    + assign_public_ip      = "true"
    + subnet_id             =
"ocid1.subnet.XXXXXX.XXXXXX.g8oals0oczkhxhl2nr1nuldpscia0jhvcsyx4mit15o81pyqhmhbps0c91tu1"
  }
  + 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
```

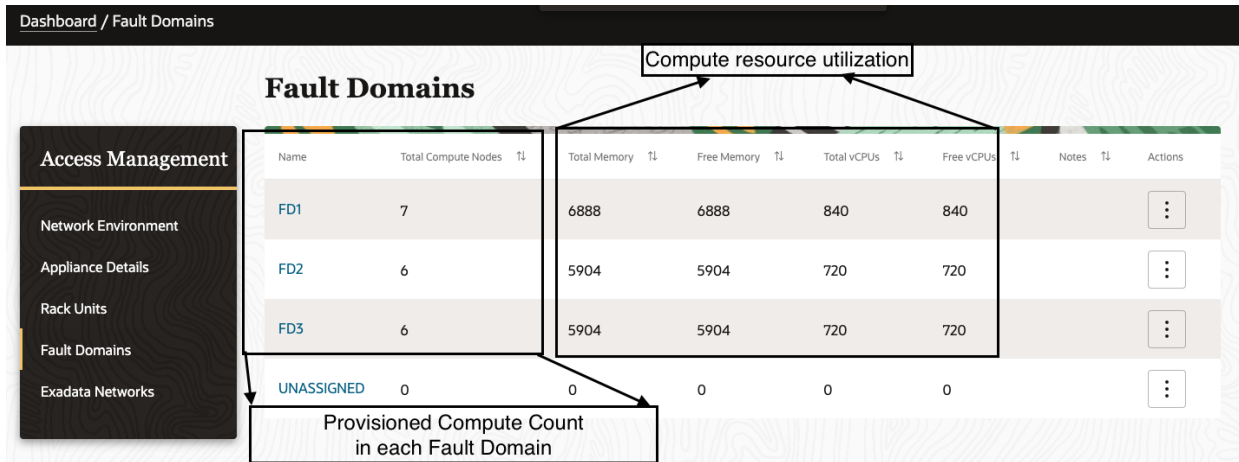
```
[id=ocid1.instance.XXXXXX.XXXXXX.i38gl920b5rm1wvtpeioqphvx0ls25i2sf15lna8uqtq8rw0cmz8r4pbd2w6]
```

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


Monitoring

PCA 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 of the OCPUs

Fault Domain Observability via Admin CLI

```

PCA-ADMIN> getFaultDomainInfo
Command: getFaultDomainInfo
Status: Success
Time: 2022-10-14 16:06:59,762 UTC
Data:
  id          totalCNs  totalMemory  freeMemory  totalvCPUs  freevCPUs  notes
  --          -
UNASSIGNED  0         0.0         0.0         0           0
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
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,
  "memory-in-gbs": 16.0,
  "networking-bandwidth-in-gbps": 1.0,
  "ocpus": 1.0,
```

UPDATING SHAPES

Updating the shape requires terminating the instance while preserving boot volumes and the 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 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
```

Relaunch Instance with Flex Shape

```
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
```

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

CONCLUSION

Following the above steps, Oracle PCA 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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