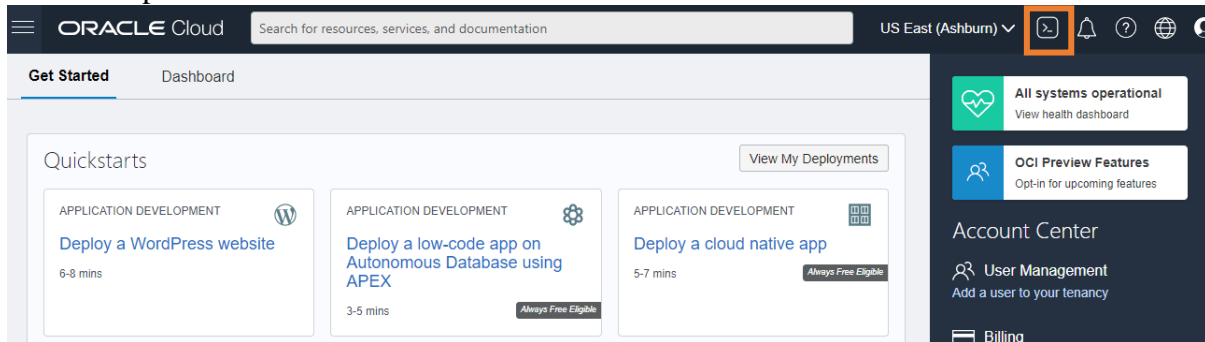


EXERCICIO 1 – CRIANDO CHAVE SSH

PASSO 1 – Acesse o OCI Cloud Shell clicando no botão do menu superior direito. O OCI irá provisionar um terminal Linux no web browser



PASSO 2 – Crie um par de chaves RSA com o comando: “\$ **ssh-keygen -t rsa**”

- Mantenha o nome original (id_rsa) apertando **enter**
- O campo “Key Passphrase” é opcional

```
oci2@cloudshell:.ssh (us-ashburn-1)$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/oci2/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
```

PASSO 3 – Exiba o conteúdo da chave pública que você criou utilizando o comando: “\$ **cat ~/.ssh/id_rsa.pub**”

- **Selecione e Copie o conteúdo dessa chave**, pois a usaremos para a criação das máquinas virtuais Linux

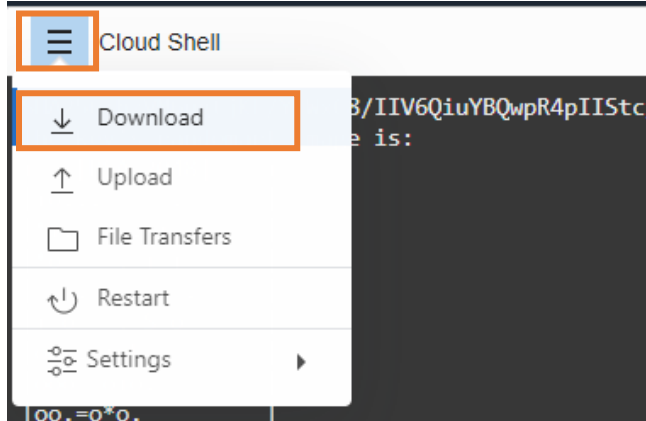
```
oci2@cloudshell:.ssh (us-ashburn-1)$ cat ~/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQDA...
oci2@cloudshell:.ssh (us-ashburn-1)$
```

A screenshot showing the output of the 'cat ~/.ssh/id_rsa.pub' command in the OCI Cloud Shell. The public key content is displayed as a long string of characters. A context menu is overlaid on the text, with the 'Copiar' (Copy) option highlighted in orange. The menu also includes 'Emoji' and 'Win+Período' options.

Para a criação da VM, usaremos a chave pública. A chave privada será usada apenas para conexão.

PASSO 4 – Baixe as duas chaves também no seu computador. Salve as chaves privadas e públicas em um local seguro.

Para isso, basta clicar no menu do Cloud Shell e solicitar o Download:



- Para baixar a chave pública, o caminho é: “.ssh/id_rsa.pub”

A screenshot of a 'Download File' dialog box. It has a title bar 'Download File'. Below the title, there is a text instruction: 'Enter the filename. The name cannot start with a "/" but can include a path relative to your home (~/) directory'. Below this, there is a text input field with the text '~/' on the line above and '.ssh/id_rsa.pub' entered in the field. Below the input field, a small note says 'Files can only be downloaded from your home directory.' At the bottom, there are two buttons: 'Download' (in blue) and 'Cancel' (in grey).

- Para baixar a chave privada, o caminho é: “.ssh/id_rsa”

A screenshot of a 'Download File' dialog box, similar to the one above. It has a title bar 'Download File'. Below the title, there is a text instruction: 'Enter the filename. The name cannot start with a "/" but can include a path relative to your home (~/) directory'. Below this, there is a text input field with the text '~/' on the line above and '.ssh/id_rsa' entered in the field. Below the input field, a small note says 'Files can only be downloaded from your home directory.' At the bottom, there are two buttons: 'Download' (in blue) and 'Cancel' (in grey).

EXERCICIO 2 – CRIANDO VM LINUX

PASSO 1 - No Menu Principal, clique em : Compute > Instances, então “Create Instance” (Botão Azul) :

Name you instance: VM-OracleLinux-AD1

Availability Domain: AD 1

Operating System: Oracle Linux 7.9

Instance Type: Virtual Machine

Instance Shape: AMD VM.StandardE2.1

Choose SSH Key File: Insira a chave SSH pública (.pub)

Virtual Cloud Network Compartment: <Seu Compartmento>

Virtual Cloud Network: <Sua VCN>

Subnet Compartment: <Sua Compartmento>

Subnet: Public Subnet

Assign Public IP Address

- Lembre-se de escolher o AD certo e seu Compartmento

Create Compute Instance

NAME
instance-20201115-1207

CREATE IN COMPARTMENT
Compartmento-Trial
(root)/Compartmento-Trial

Configure placement and hardware Edit

Placement Availability Domain: AD-2 <small>Always Free Eligible</small> Fault Domain: Oracle will choose the best placement.	Shape Shape: VM.Standard.E2.1.Micro <small>Always Free Eligible</small> OCPU Count: 1 Memory (GB): 1 Network Bandwidth (Gbps): 0.48
Image Image: Oracle Linux 7.9 Image build: 2020.11.10-1	

PASSO 2 - Depois de expandir as opções de Shapes e Network, insira os dados necessários para concluir o processo de criação:

Configure placement and hardware Collapse

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

AVAILABILITY DOMAIN

AD 1 HuYF:US-ASHBURN-AD-1	AD 2 <i>Always Free Eligible</i> HuYF:US-ASHBURN-AD-2 ✓	AD 3 HuYF:US-ASHBURN-AD-3
------------------------------	--	------------------------------

☐ CHOOSE A FAULT DOMAIN FOR THIS INSTANCE
If you don't select a fault domain, Oracle will choose the best placement for you. [Learn more](#)

Image

Oracle Linux 7.9
Image Build: 2020.11.10-1 Change Image

Shape

VM.Standard.E2.1.Micro *Always Free Eligible*
Virtual Machine, 1 core OCPU, 1 GB memory, 0.48 Gbps network bandwidth Change Shape

Annotations:

- Selezione aqui o AD desejado (points to AD 2)
- Selezione aqui o Sistema Operacional (points to Oracle Linux 7.9)
- Selezione aqui o Shape desejado (points to VM.Standard.E2.1.Micro)

PASSO 3 – Para alterar as informações de rede, clique em “Edit”. Ao inserir as informações de rede, lembre-se de escolher a opção “Assign a Public IP address” para Atribuir um endereço IP público à instância de computação.

Configure networking Edit Collapse

Virtual cloud network: VCN-TRIAL **Use network security groups to control traffic:** No

Subnet: Public Subnet-VCN-TRIAL **Assign a public IPv4 address:** Yes

Configure 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 COMPARTIMENTO-TRIAL [\(CHANGE COMPARTMENT\)](#)

VCN-TRIAL

SUBNET

☒ SELECT EXISTING SUBNET ☐ CREATE NEW PUBLIC SUBNET

SUBNET IN COMPARTIMENTO-TRIAL [\(CHANGE COMPARTMENT\)](#)

Public Subnet-VCN-TRIAL (Regional)

☐ USE NETWORK SECURITY GROUPS TO CONTROL TRAFFIC [?](#)

PUBLIC IP ADDRESS

☒ ASSIGN A PUBLIC IPV4 ADDRESS ☐ DO NOT ASSIGN A PUBLIC IPV4 ADDRESS

Warning: 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.

Annotation: Edit (points to the Edit button in the top right corner)

PASSO 4 – Cole a chave pública SSH criada por você no exercício 3A e clique no botão “Create”.

Add SSH keys

Generate an [SSH key pair](#) to connect to the instance using SSH, or upload a public key that you already have.

☐ Generate a key pair for me ☐ Upload public key files (.pub) ☒ Paste public keys ☐ No SSH keys

SSH keys

Emoji

Win+Período

Anular

Repetir

Cortar

Copiar

Colar

Colar como texto simples

Seleccionar tudo

Verificação ortográfica

Direcção da escrita

Inspecionar

Ctrl+Z

Ctrl+Shift+Z

Ctrl+X

Ctrl+C

Ctrl+V

Ctrl+Shift+V

Ctrl+A

Ctrl+Shift+I

+ Another Key

Example: ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQDA...

[all supported key types](#)

Boot volume

Your [boot volume](#) is the image used to boot your compute instance.

☐ Specify a custom boot volume size. The default size is 46.6 GB. When you specify a custom boot volume size, service limits apply.

☒ Use instance profile. [Encrypts data](#) in transit between the instance, the boot volume, and the block volumes.

☐ 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](#)

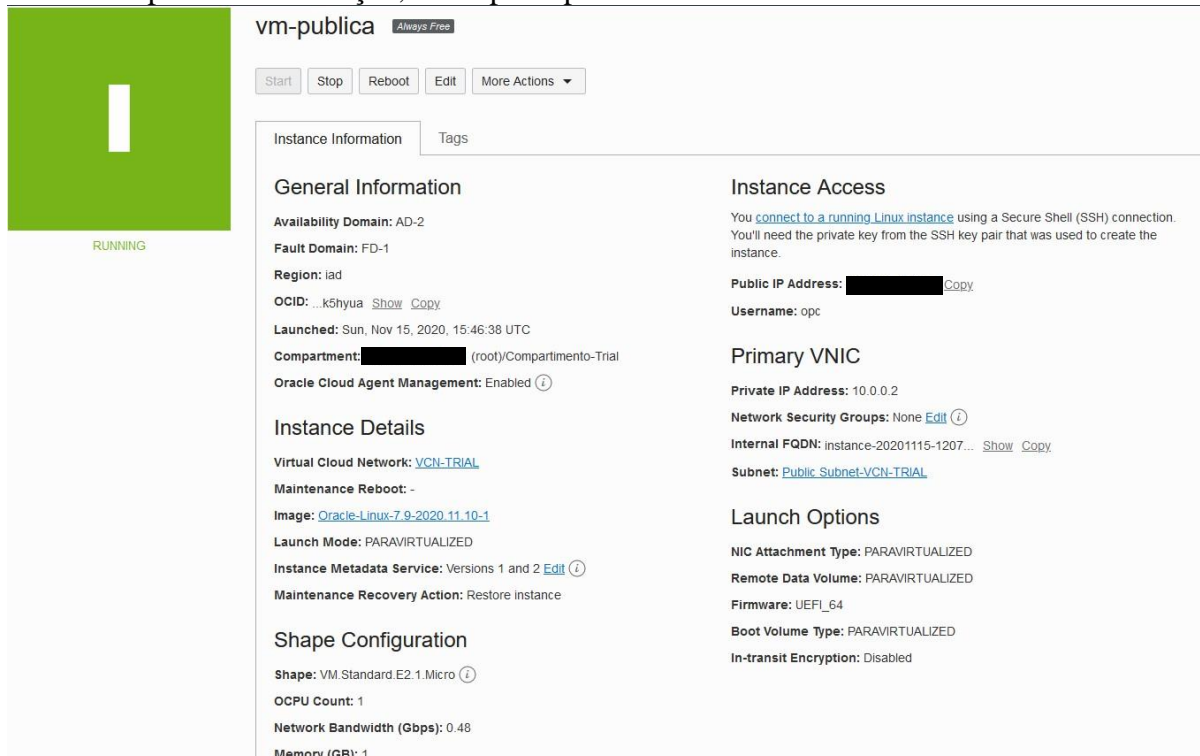
[Show advanced options](#)

Create

Save as Stack

Cancel

Você provavelmente terá a nova instância devidamente criada em alguns minutos. Depois de terminar o processo de criação, a tela principal ficará assim:



The screenshot displays the Oracle Cloud console interface for a VM instance named "vm-publica". On the left, a green square with a white "I" icon and the word "RUNNING" below it indicates the instance's status. To the right of this icon are buttons for "Start", "Stop", "Reboot", "Edit", and "More Actions". The main content area is divided into several sections:

- Instance Information:** Includes "General Information" (Availability Domain: AD-2, Fault Domain: FD-1, Region: iad, OCID: ...k5hyua, Launched: Sun, Nov 15, 2020, 15:46:38 UTC, Compartment: (root)/Compartimento-Trial, Oracle Cloud Agent Management: Enabled) and "Instance Details" (Virtual Cloud Network: VCN-TRIAL, Maintenance Reboot: -, Image: Oracle-Linux-7.9-2020.11.10-1, Launch Mode: PARAVIRTUALIZED, Instance Metadata Service: Versions 1 and 2, Maintenance Recovery Action: Restore instance).
- Shape Configuration:** Lists "Shape: VM.Standard.E2.1.Micro", "OCPU Count: 1", "Network Bandwidth (Gbps): 0.48", and "Memory (GB): 1".
- Instance Access:** Provides instructions on connecting via SSH and shows the "Public IP Address" (redacted) and "Username: opc".
- Primary VNIC:** Shows "Private IP Address: 10.0.0.2", "Network Security Groups: None", "Internal FQDN: instance-20201115-1207...", and "Subnet: Public.Subnet-VCN-TRIAL".
- Launch Options:** Lists "NIC Attachment Type: PARAVIRTUALIZED", "Remote Data Volume: PARAVIRTUALIZED", "Firmware: UEFI_64", "Boot Volume Type: PARAVIRTUALIZED", and "In-transit Encryption: Disabled".

EXERCICIO 3 – Acessando a VM através do CloudShell

PASSO 6 - Primeiro passo: Pegue o IP Público da Instância

Instances in Compartimento-Trial *Compartment*

The [Compute service](#) helps you provision VMs and bare metal instances to meet your compute and application requirements. An [instance](#) is a compute host. Choose between virtual machines (VMs) and bare metal instances. The image that you use to launch an instance determines its operating system and other software.

Create Instance									
Name	State	Public IP	Shape	OCPU Count	Memory (GB)	Availability Domain	Fault Domain	Created	
vm-publica <small>Always Free</small>	● Running	15[REDACTED]81	VM.Standard.E2.1.Micro	1	1	AD-2	FD-1	Sun, Nov 15, 2020, 15:46:38 UTC	⋮

Showing 1 item < 1 of 1 >

PASSO 7 - No OCI Cloud Shell, faça conexão com a máquina criada com o comando:

“**ssh opc@<ip publico da VM>**”

- O usuário default nas instâncias Oracle Linux é **opc**

```
ocift2@cloudshell:~ (us-ashburn-1)$ ssh opc@193.122.146.254
The authenticity of host '193.122.146.254 (193.122.146.254)' can't be established.
ECDSA key fingerprint is SHA256:Wt9xpSUXQ0sWoyMRYP8rsqHxsEm2JLggZBCtGHtQCXM.
ECDSA key fingerprint is MD5:54:46:8c:28:1c:4e:95:8d:12:cd:dd:14:4a:9e:21:94.
Are you sure you want to continue connecting (yes/no): yes
Warning: Permanently added '193.122.146.254' (ECDSA) to the list of known hosts.
[opc@vmlinux ~]$
```

Conexão feita com a VM Linux através do usuário OPC

EXERCICIO 4 – Criando um Instance Pool com Autoscaling Policy

PASSO 1: Para criar uma configuração de instância, você pode seguir as etapas abaixo: Entre na Instância que deseja copiar a imagem e clique em “More Actions”:



Escolha o nome da Instance Configuration

Create instance configuration [Help](#)

Create in compartment

PROD

ociff1 (root)/PROD

Name


instance-config-20210930-0736

[Show tagging options](#)

[Create instance configuration](#) [Cancel](#)

PASSO 2: Depois de criar sua instance configuration, você poderá criar seu Instance Pool

[Compute](#) » [Instance configurations](#) » Instance configuration details



instance-config-20210930-0733

[Launch instance](#) [Create instance pool](#) [Edit](#) [Delete](#) [More Actions](#) ▼

Instance configuration information Tags

Instance configuration information

OCID: ...g6hbka [Show](#) [Copy](#)

Boot volume type: Oracle-provided OS image

Instance configuration compartment: ociff1 (root)/PROD

PASSO 3: O pool de instâncias criará as instâncias de computação que serão usadas para receber a carga do aplicativo.

Create instance pool

1 Add basic details
2 Configure pool placement
3 Review

Name: instance-pool-20210930-0739

Create in compartment: PROD

Instance configuration in PROD: instance-config-20210930-0733

Number of instances: 0

The number of instances that can be provisioned is limited by your tenancy's service limits.

Instance configuration details

- Instance configuration information
- Shape configuration

PASSO 4: Clique no botão Avançar e insira informações de AD / FD / Rede para o Pool:

Availability domains

Availability domain selection 1

Availability domain: AD 1

Fault domains: FAULT-DOMAIN-1 x FAULT-DOMAIN-3 x

Primary VNIC: VCN-PROD

Select a subnet in PROD: Public Subnet-VCN-PROD (regional)

+ Another availability domain

PASSO 5: Concluindo o assistente, seu pool será provisionado. Observe que o número de instâncias no pool determinará o tempo necessário para a criação.

Após o provisionamento, o Pool se parecerá com a seguinte tela:

instance-pool-20200723-1444

Edit Start Stop Reboot More Actions

Instance Pool Information Tags

OCID: ...zbxcmq Show Copy

Availability Domain: AD-1

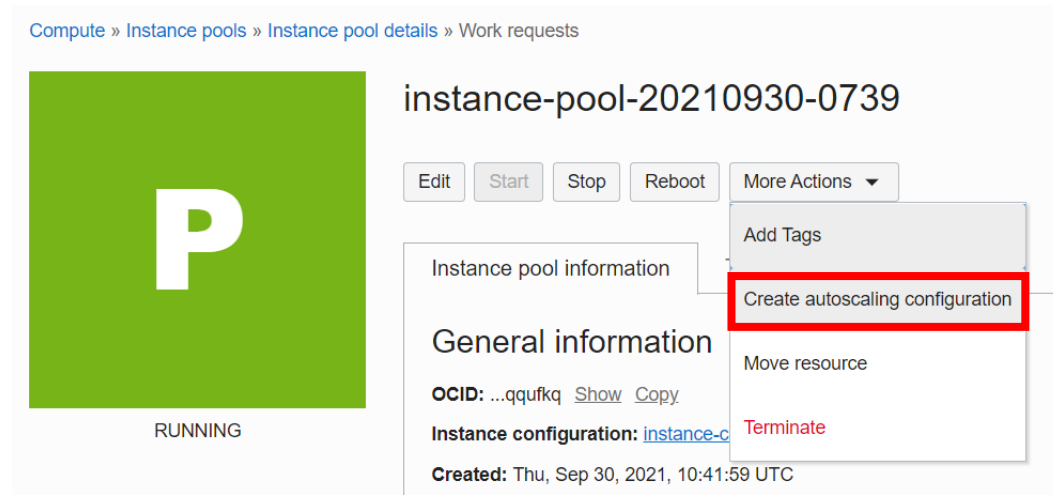
Compartment: bmc-flaviop (root)/lad-compartment

Target Instance Count: 1

Instance Configuration: instance-config-apache

Created: Thu, Jul 23, 2020, 17:46:09 UTC

PASSO 6: Na tela Instance Pool, você pode criar a política de escalonamento automático.



PASSO 7: Forneça o nome da política, o pool de instâncias que será usado

Create autoscaling configuration

1 Add basic details
2 Configure autoscaling policy
3 Review

Name: autoscaling-config-20210930-0744

Create in compartment: PROD

Instance pool: instance-pool-20210930-0739

Show tagging options

O OCI possibilita 2 tipos de políticas de Autoscaling :

- Metric Based – Baseada em métricas de utilização dos recursos do pool
- Schedule-based Autoscaling – Baseada em agendamento

Metric-based autoscaling Performance metrics such as CPU utilization trigger autoscaling events. ✓	Schedule-based autoscaling Autoscaling events take place at the specific times that you schedule.
--	---

PASSO 8: para este exercício, usaremos a escala automática "Metric-based".

Metric-based Autoscaling ☒ Schedule-based Autoscaling

Performance metrics such as CPU utilization trigger autoscaling events. ✓ Autoscaling events take place at the specific times that you schedule.

Configure Autoscaling Policy

AUTOSCALING POLICY NAME
autoscaling-policy-20200723-1452

COOLDOWN IN SECONDS ⓘ
300
The minimum value is 300 seconds, which is also the default value.

PERFORMANCE METRIC ⓘ
CPU utilization

Tempo em segundos para crescer ou diminuir o pool automaticamente

Métrica: CPU ou Memory

PASSO 9: Na segunda parte da tela, você pode especificar os limites da política para ações de pesquisa (aumentar e diminuir)

Scale-out rule

Scale-out operator
Greater than (>)

Threshold percentage ⓘ
30

Number of instances to add
1

Scale-in rule

Scale-in operator
Less than (<)

Threshold percentage ⓘ
10

Number of instances to remove
1

Scaling limits

Minimum number of instances
1

Maximum number of instances ⓘ
3

Initial number of instances
1

Após concluir os limites da política de autoscaling, finalize a criação do Autoscaling Configuration

PASSO 10: Agora que temos todos os componentes de escalonamento configurados, podemos começar a “estressar” o pool de recursos e testar a política de escalonamento. Para isso, utilizaremos a ferramenta “stress”

AS
ENABLED

autoscaling-config-20200723-1452

Edit Disable Move Resource Add Tags Delete

Autoscaling Configuration Information Tags

OCID: ...5ajaeq Show Copy
Created: Thu, Jul 23, 2020, 18:03:33 UTC
Cooldown Period: 300 seconds

Compartment: bmc-flaviop (root/lad-compartment)
Instance Pool: [instance-pool-20200723-1444](#)

Resources

Autoscaling Policies

Autoscaling policies define the criteria that trigger autoscaling actions and the actions to take.

Edit

Policy Name	Policy Type	Performance Metric
autoscaling-policy-20200723-1452	Threshold	CPU utilization

PASSO 11: É importante observar que a sobrecarga da CPU deve ser criada na VM do pool de instâncias, não no servidor APP original.

Para monitorar o uso da CPU no pool, você pode usar a tela principal do “Metrics Explorer”.

ORACLE Cloud

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PASSO 12: Estabeleça uma conexão SSH com a instância do Pool pelo IP Público ou configurando um Bastion Service e utilize os comandos:

\$ **sudo su -**

rpm -Uvh https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm

yum install stress -y

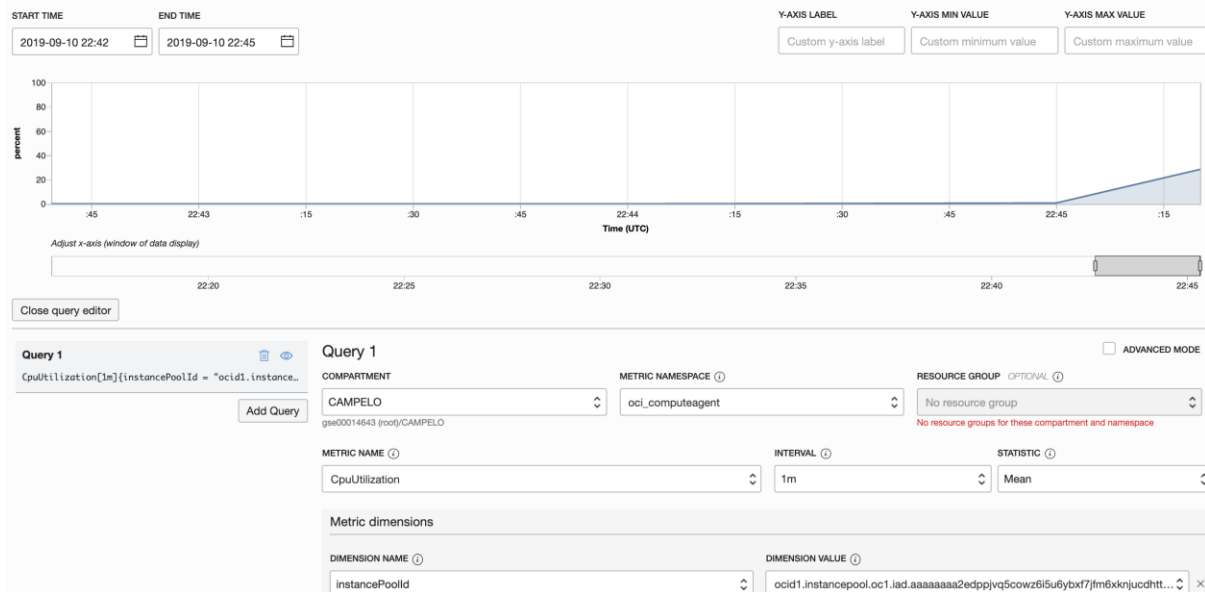
stress --cpu 20 --timeout 12000

```
top - 22:49:49 up 34 min, 1 user, load average: 19.82, 12.18, 5.22
Tasks: 156 total, 21 running, 69 sleeping, 0 stopped, 0 zombie
%Cpu(s): 99.8 us, 0.2 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 15117492 total, 14581516 free, 264932 used, 271044 buff/cache
KiB Swap: 8388604 total, 8388604 free, 0 used, 14530180 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
16206	root	20	0	7320	96	0	R	10.0	0.0	0:27.98	stress
16207	root	20	0	7320	96	0	R	10.0	0.0	0:27.98	stress
16208	root	20	0	7320	96	0	R	10.0	0.0	0:27.98	stress
16209	root	20	0	7320	96	0	R	10.0	0.0	0:27.98	stress
16210	root	20	0	7320	96	0	R	10.0	0.0	0:27.98	stress
16211	root	20	0	7320	96	0	R	10.0	0.0	0:27.98	stress
16212	root	20	0	7320	96	0	R	10.0	0.0	0:27.98	stress
16213	root	20	0	7320	96	0	R	10.0	0.0	0:27.98	stress
16214	root	20	0	7320	96	0	R	10.0	0.0	0:27.98	stress
16215	root	20	0	7320	96	0	R	10.0	0.0	0:28.01	stress
16216	root	20	0	7320	96	0	R	10.0	0.0	0:28.02	stress
16217	root	20	0	7320	96	0	R	10.0	0.0	0:28.02	stress
16218	root	20	0	7320	96	0	R	10.0	0.0	0:28.02	stress
16219	root	20	0	7320	96	0	R	10.0	0.0	0:28.02	stress
16220	root	20	0	7320	96	0	R	10.0	0.0	0:28.02	stress
16221	root	20	0	7320	96	0	R	10.0	0.0	0:28.02	stress
16223	root	20	0	7320	96	0	R	10.0	0.0	0:28.01	stress
16224	root	20	0	7320	96	0	R	10.0	0.0	0:28.07	stress
16225	root	20	0	7320	96	0	R	10.0	0.0	0:28.02	stress
16222	root	20	0	7320	96	0	R	9.6	0.0	0:28.01	stress
4709	oracle-+	20	0	439620	68912	11196	S	1.0	0.5	0:06.62	oracle-cloud-ag
16227	root	20	0	162024	4472	3748	R	0.3	0.0	0:00.61	top
1	root	20	0	128128	8248	5672	S	0.0	0.1	0:03.14	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd

Metrics Explorer

Write and edit queries in Monitoring Query Language (MQL), using metrics from either your application or an Oracle Cloud Infrastructure service.



PASSO 12: Após 5 minutos de estresse da CPU, o pool de instâncias implantou uma nova VM no pool, como você pode ver, o pool tem 2 instâncias:



inst_pool_app

[Edit](#)
[Start](#)
[Stop](#)
[Reboot](#)
[Add Tags](#)
[Move Resource](#)
[Actions](#)

Instance Pool Information

OCID: ...oo24ja [Show](#) [Copy](#)

Availability Domain: AD-2

Compartment: gse00014643 (root)/CAMPELO

Resources

[Created Instances \(2\)](#)

[Load Balancers \(0\)](#)

[Work Requests \(2\)](#)

Created Instances

Name	Status	Availability Domain
inst-odnra-inst_pool_app	● Running	AD-2
inst-jlmhi-inst_pool_app	● Running	AD-2

PASSO 13: À medida que a CPU continua sob estresse, outra instância de computação é provisionada

Created Instances

Name	Status	Availability Domain
inst-odnra-inst_pool_app	● Running	AD-2
inst-z4jfo-inst_pool_app	● Running	AD-2
inst-jlmhi-inst_pool_app	● Running	AD-2

PASSO 14: 5 minutos após o término do estresse da CPU, o pool de instâncias retornou à configuração original:

Created Instances

Name	Status	Availability Domain
inst-odnra-inst_pool_app	● Terminating	AD-2
inst-z4jfo-inst_pool_app	● Running	AD-2
inst-jlmhi-inst_pool_app	● Running	AD-2

Created Instances

Name	Status	Availability Domain
inst-z4jfo-inst_pool_app	● Running	AD-2
inst-jlmhi-inst_pool_app	● Terminating	AD-2

PASSO 15: Você pode acompanhar todas as atividades do Pool através do link “Work Request”, no lado esquerdo da tela:

Work Requests

Operation	Status	% Complete	Accepted
Terminate instances in pool	● In Progress	42	Tue, Sep 10, 2019, 23:19:12 UTC
Terminate instances in pool	● Succeeded	100	Tue, Sep 10, 2019, 23:10:35 UTC
Create instances in pool	● Succeeded	100	Tue, Sep 10, 2019, 22:59:30 UTC
Create instances in pool	● Succeeded	100	Tue, Sep 10, 2019, 22:51:26 UTC
Create instances in pool	● Succeeded	100	Tue, Sep 10, 2019, 22:14:01 UTC