

Gcloud - Módulo 4 | Lift & Shift + Modernização de Aplicação - Rodrigo Marques

terça-feira, 2 de julho de 2024 21:05

Criação da instância Lift & Shift

The screenshot shows the Google Cloud Compute Engine interface. On the left, a sidebar lists various services like Compute Engine, Virtual machines, Instance templates, Sole-tenant nodes, Machine images, TPUs, Committed use discounts, Reservations, and Migrate to Virtual Machin... Under Storage, it shows Marketplace and Release Notes. The main content area is titled 'VM instances' and shows a table of existing instances. One instance, 'app-01-vm', is listed with details: Status (Running), Name (app-01-vm), Zone (us-west1-a), Internal IP (10.138.0.2), External IP (34.19.115.179), and Connect (SSH). Below the table, there's a section titled 'Related actions' with links to Explore Backup and DR, View billing report, Monitor VMs, Explore VM logs, Set up firewall rules, Patch management, and Load balance between VMs.

Instalação apache

```
Enabling module auth_basic.
Enabling module access_compat.
Enabling module authn_file.
Enabling module authz_user.
Enabling module alias.
Enabling module dir.
Enabling module autoindex.
Enabling module env.
Enabling module mime.
Enabling module negotiation.
Enabling module setenvif.
Enabling module filter.
Enabling module deflate.
Enabling module status.
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-hosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36.1-4ubuntu0.1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.6) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.
No services need to be restarted.
No containers need to be restarted.
No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ricoy_sistemas@app-01-vm:~$
```

Configuração da aplicação

```
ssh.cloud.google.com/v2/ssh/projects/tcb-m2c-428201/zones/us-west1-a/instances/app-01-vm?authuser=0&hl=en_US&projectNumber=2... - X
https://ssh.cloud.google.com/v2/ssh/projects/tcb-m2c-428201/zones/us-west1-a/instances/app-01-vm?authuser=0&hl=en_US&pro... ✎

SSH-in-browser
UPLOAD FILE DOWNLOAD FILE ! 📱 🛡️ 🚫

inflating: background.jpeg
inflating: erro.html
inflating: font-awesome.min.css
inflating: fontawesome-webfont.eot
inflating: fontawesome-webfont.svg
inflating: fontawesome-webfont.ttf
inflating: fontawesome-webfont.woff
extracting: fontawesome-webfont.woff2
inflating: FontAwesome.otf
inflating: index.html
inflating: jquery.min.js
inflating: jquery.scrolllex.min.js
inflating: jquery.scrollly.min.js
inflating: LICENSE.txt
inflating: main.css
inflating: main.js
inflating: pic01.jpg
inflating: skel.min.js
inflating: util.js
creating: __MACOSX/
inflating: __MACOSX/.background.jpeg
inflating: __MACOSX/.erro.html
inflating: __MACOSX/.font-awesome.min.css
inflating: __MACOSX/.fontawesome-webfont.eot
inflating: __MACOSX/.fontawesome-webfont.svg
inflating: __MACOSX/.fontawesome-webfont.ttf
inflating: __MACOSX/.fontawesome-webfont.woff
inflating: __MACOSX/.fontawesome-webfont.woff2
inflating: __MACOSX/.FontAwesome.otf
inflating: __MACOSX/.index.html
inflating: __MACOSX/.jquery.min.js
inflating: __MACOSX/.jquery.scrolllex.min.js
inflating: __MACOSX/.jquery.scrollly.min.js
inflating: __MACOSX/.LICENSE.txt
inflating: __MACOSX/.main.css
inflating: __MACOSX/.main.js
inflating: __MACOSX/.pic01.jpg
inflating: __MACOSX/.skel.min.js
inflating: __MACOSX/.util.js
ricoy_sistemas@app-01-vm:~/var/www/html$ sudo chmod 644 *
ricoy_sistemas@app-01-vm:~/var/www/html$
```

A screenshot of a web browser window. The address bar shows 'http://34.19.115.179' with a 'Não seguro' (Not secure) warning. The title bar says 'Aplicação em execução'. The page content is a landing page for 'Talent Management Portal' by 'Cloud Consulting'. It features a background image of a person working at a desk with a laptop and papers. In the center, there is a large white text 'Talent Management Portal'. Below it, a message reads 'How to contact the Talent Management team? Just click on Learn More.' A prominent red button with white text 'Learn More' is positioned below the message. The browser's toolbar at the top includes icons for back, forward, search, and various extensions. The taskbar at the bottom shows several open application windows.

Criação da instância para execução do processo de migração

```

  ricoy_sistemas@cloudshell:~ (tcb-m2c-428201) $ gcloud compute instances create tcb-vm \
    --zone=us-west1-a --machine-type=e2-medium \
    --subnet=default --scopes="cloud-platform" \
    --tags=http-server,https-server --image=ubuntu-2204-jammy-v20240319 \
    --image-project=ubuntu-os-cloud --boot-disk-size=50GB --boot-disk-type=pd-standard \
    --boot-disk-device-name=tcb-vm
WARNING: You have selected a disk size of under [200GB]. This may result in poor I/O performance. For more information, see: https://developers.google.com/compute/docs/disks#performance.
Created [https://www.googleapis.com/compute/v1/projects/tcb-m2c-428201/zones/us-west1-a/instances/tcb-vm].
WARNING: Some requests generated warnings:
- Disk size: '50 GB' is larger than image size: '10 GB'. You might need to resize the root repartition manually if the operating system does not support automatic resizing. See https://cloud.google.com/compute/docs/disks/add-persistent-disk#resize_pd for details.
- The resource 'projects/ubuntu-os-cloud/global/images/ubuntu-2204-jammy-v20240319' is deprecated. A suggested replacement is 'projects/ubuntu-os-cloud/global/images/ubuntu-2204-jammy-v20240701'.

NAME: tcb-vm
ZONE: us-west1-a
MACHINE_TYPE: e2-medium
PREEMPTIBLE:
INTERNAL_IP: 10.138.0.3
EXTERNAL_IP: 34.19.62.93
STATUS: RUNNING
ricoy_sistemas@cloudshell:~ (tcb-m2c-428201) $ 

```

The screenshot shows the Google Cloud Compute Engine interface for managing VM instances. The left sidebar has a 'Virtual machines' section with 'VM instances' selected. The main area displays a table of VM instances with columns for Status, Name, Zone, Recommendations, In use by, Internal IP, External IP, and Connect (SSH). Two instances are listed: 'app-01-vm' and 'tcb-vm'. Below the table, there's a 'Related actions' section with links to 'Explore Backup and DR', 'View billing report', 'Monitor VMs', 'Explore VM logs', 'Set up firewall rules', and 'Patch management'. A modal at the bottom center says 'VM instance started' with a close button.

Status	Name	Zone	Recommendations	In use by	Internal IP	External IP	Connect
<input type="checkbox"/>	app-01-vm	us-west1-a			10.138.0.2 (nic0)	34.19.29. (nic0)	SSH
<input checked="" type="checkbox"/>	tcb-vm	us-west1-a			10.138.0.3 (nic0)	34.19.62. (nic0)	SSH

Setup das ferramentas na VM

SSH-in-browser

Checking network connection...done.
Reachability Check passed.
Network diagnostic passed (1/1 checks passed).

Choose the account you would like to use to perform operations for this configuration:
 [1] 258034804463-compute@developer.gserviceaccount.com
 [2] Log in with a new account
 Please enter your numeric choice: 1

You are logged in as: [258034804463-compute@developer.gserviceaccount.com].

Pick cloud project to use:
 [1] tcb-m2c-428201
 [2] Enter a project ID
 [3] Create a new project
 Please enter numeric choice or text value (must exactly match list item): 1

Your current project has been set to: [tcb-m2c-428201].

Do you want to configure a default Compute Region and Zone? (Y/n)? n

Created a default .boto configuration file at [/home/ricoy_sistemas/.boto]. See this file and [<https://cloud.google.com/storage/docs/gsutil/commands/config>] for more information about configuring Google Cloud Storage.
 Your Google Cloud SDK is configured and ready to use!

* Commands that require authentication will use 258034804463-compute@developer.gserviceaccount.com by default
 * Commands will reference project 'tcb-m2c-428201' by default
 Run `gcloud help config` to learn how to change individual settings

This gcloud configuration is called [default]. You can create additional configurations if you work with multiple accounts and/or projects.
 Run `gcloud topic configurations` to learn more.

Some things to try next:

- * Run `gcloud --help` to see the Cloud Platform services you can interact with. And run `gcloud help COMMAND` to get help on any gcloud command.
- * Run `gcloud topic --help` to learn about advanced features of the SDK like arg files and output formatting
- * Run `gcloud cheat-sheet` to see a roster of go-to `gcloud` commands.

```
ricoy_sistemas@tcb-vm:~$
```

Setup do Docker na VM

SSH-in-browser

Go version: gol.21.11
 Git commit: 662f78c
 Built: Sat Jun 29 00:02:33 2024
 OS/Arch: linux/amd64
 Experimental: false
 containerd:
 Version: 1.7.18
 GitCommit: ae71819c4f5e67bb4d5ae76a6b735f29cc25774e
 runc:
 Version: 1.7.18
 GitCommit: v1.1.13-0-g58aa920
 docker-init:
 Version: 0.19.0
 GitCommit: de40ad0

To run Docker as a non-privileged user, consider setting up the Docker daemon in rootless mode for your user:

```
dockerd-rootless-setuptool.sh install
```

Visit <https://docs.docker.com/go/rootless/> to learn about rootless mode.

To run the Docker daemon as a fully privileged service, but granting non-root users access, refer to <https://docs.docker.com/go/daemon-access/>

WARNING: Access to the remote API on a privileged Docker daemon is equivalent to root access on the host. Refer to the 'Docker daemon attack surface' documentation for details: <https://docs.docker.com/go/attack-surface/>

```
ricoy_sistemas@tcb-vm:~$ sudo usermod -aG docker $USER
ricoy_sistemas@tcb-vm:~$ newgrp docker
ricoy_sistemas@tcb-vm:~$ docker ps -a
CONTAINER ID        IMAGE               COMMAND      CREATED     STATUS      PORTS      NAMES
ricoy_sistemas@tcb-vm:~$ docker images
REPOSITORY          TAG                 IMAGE ID      CREATED     SIZE
ricoy_sistemas@tcb-vm:~$
```

Setup Skaffold na VM

SSH-in-browser

ssh.cloud.google.com/v2/ssh/projects/tcb-m2c-428201/zones/us-west1-a/instances/tcb-vm?authuser=0&hl=en_US&projectNumber=2580...

https://ssh.cloud.google.com/v2/ssh/projects/tcb-m2c-428201/zones/us-west1-a/instances/tcb-vm?authuser=0&hl=en_US&projectNumber=2580...

```
ricoy_sistemas@tcb-vm:~$ sudo install skaffold /usr/local/bin/
ricoy_sistemas@tcb-vm:~$ skaffold version
v2.12.0
ricoy_sistemas@tcb-vm:~$
```

Setup m2c (migrate to container)

```
ricoy_sistemas@tcb-vm:~$ curl -O "https://m2c-cli-release.storage.googleapis.com/$(curl -s https://m2c-cli-release.storage.googleapis.com/latest)/linux/amd64/m2c"
ricoy_sistemas@tcb-vm:~$ chmod +x ./m2c
ricoy_sistemas@tcb-vm:~$ ./m2c version
To help improve the quality of this product, we collect pseudoanonymized usage data; additional information is available at <https://cloud.google.com/migrate/anthos/docs/usage-statistics>.
This data is handled in accordance with our privacy policy <https://cloud.google.com/terms/cloud-privacy-notice>.
You may opt out at any time by running the following command:
$ m2c config set deactivate_usage_reporting true
1.2.2
ricoy_sistemas@tcb-vm:~$
```

Criação de filtro para cópia de sistema de arquivos da VM

```
ricoy_sistemas@tcb-vm:~$ ./m2c copy default-filters > filters.txt
filters.txt  m2c  snap
ricoy_sistemas@tcb-vm:~$ ls
filters.txt  m2c  snap
ricoy_sistemas@tcb-vm:~$ cat filters.txt
- /proc/*
- /boot/*
- /sys/*
- /dev/*
- /lib/modules/*
- /usr/share/man/*
- /usr/share/doc/*
- /var/cache/*
- /var/backups/*
- /var/log/*
- /var/tmp/*
- /var/run/*
- /var/lib/lxcfs/*
- /run/*
ricoy_sistemas@tcb-vm:~$ vim filters.txt
ricoy_sistemas@tcb-vm:~$
```

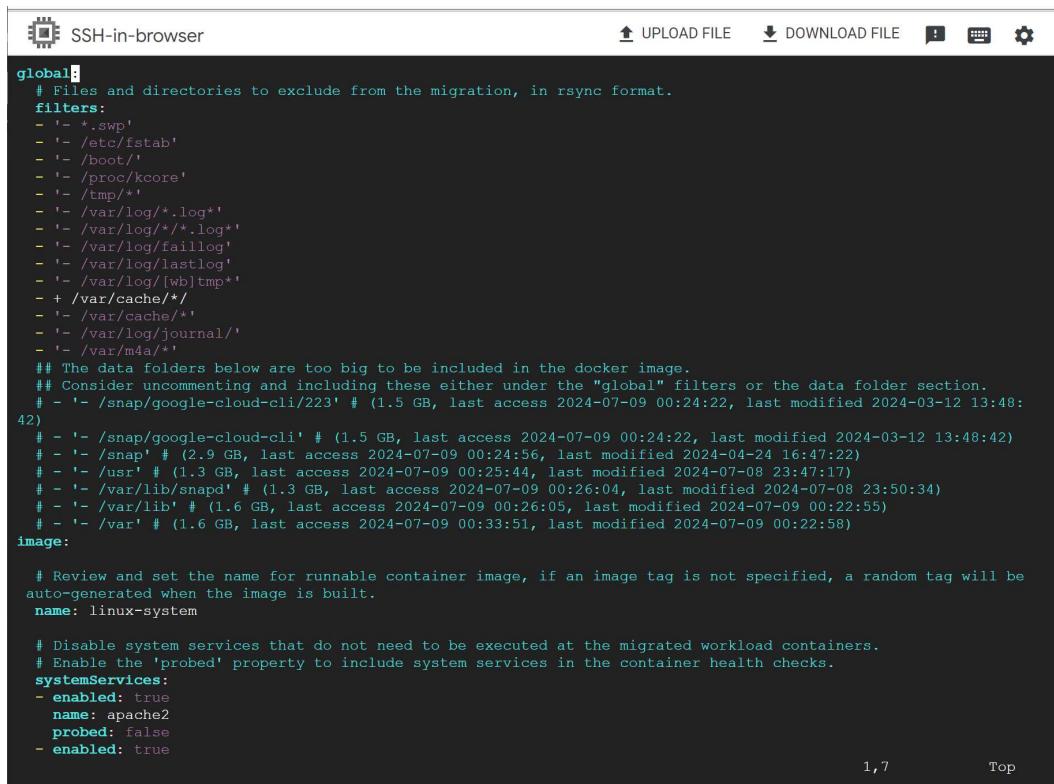
Copiando o sistema de arquivos da VM da aplicação criada no passo inicial (app-01-vm)

```
ricoy_sistemas@tcb-vm:~$ ls
filters.txt  m2c  snap
ricoy_sistemas@tcb-vm:~$ cat filters.txt
- /proc/*
- /boot/*
- /sys/*
- /dev/*
- /lib/modules/*
- /usr/share/man/*
- /usr/share/doc/*
- /var/cache/*
- /var/backups/*
- /var/log/*
- /var/tmp/*
- /var/run/*
- /var/lib/lxcfs/*
- /run/*
ricoy_sistemas@tcb-vm:~$ vim filters.txt
ricoy_sistemas@tcb-vm:~$ ./m2c copy gcloud --project tcb-m2c-428201 --zone us-west1-a \
--vm-name app-01-vm --output app-01-vm-filesystem --filters filters.txt
I   Initializing connection {"VM Name": "app-01-vm"}
E   ssh init      WARNING: The private SSH key file for gcloud does not exist.
E   ssh init      WARNING: The public SSH key file for gcloud does not exist.
E   ssh init      WARNING: You do not have an SSH key for goloud.
E   ssh init      WARNING: SSH keygen will be executed to generate a key.
E   ssh init      Updating project ssh metadata...
E   ssh init      .....Updated [https://www.googleapis.com/compute/v1/projects/tcb-m2c-428201].
E   ssh init      .done.
E   ssh init      Waiting for SSH key to propagate.
E   ssh init      Warning: Permanently added 'compute.693766487024413358' (ED25519) to the list of known hosts.
I   Copying fs using rsync...
E   rsync  Exit request sent.
ricoy_sistemas@tcb-vm:~$ ls -l
total 80060
drwxr-xr-x 19 root          root        4096 Jul  8 23:40 app-01-vm-filesystem
-rw-rw-r--  1 ricoy_sistemas docker     179 Jul  9 00:19 filters.txt
-rwxrwxr-x  1 ricoy_sistemas docker    81965076 Jul  9 00:14 m2c
drwx-----  3 ricoy_sistemas ricoy_sistemas   4096 Jul  8 23:56 snap
ricoy_sistemas@tcb-vm:~$
```

Criação do plano de migração do filesystem

```
ricoy_sistemas@tcb-vm:~$ ./m2c analyze \
--source app-01-vm-filesystem --plugin linux-vm-container \
--output analysis-output
I   Running analysis...
E   analysis container      time="2024-07-09T00:40:59Z" level=info msg="saving artifact to path: '/output/config.yaml'"
I   You can edit the modernization plan at "analysis-output/config.yaml"
```

Resultado da análise do plano de migração

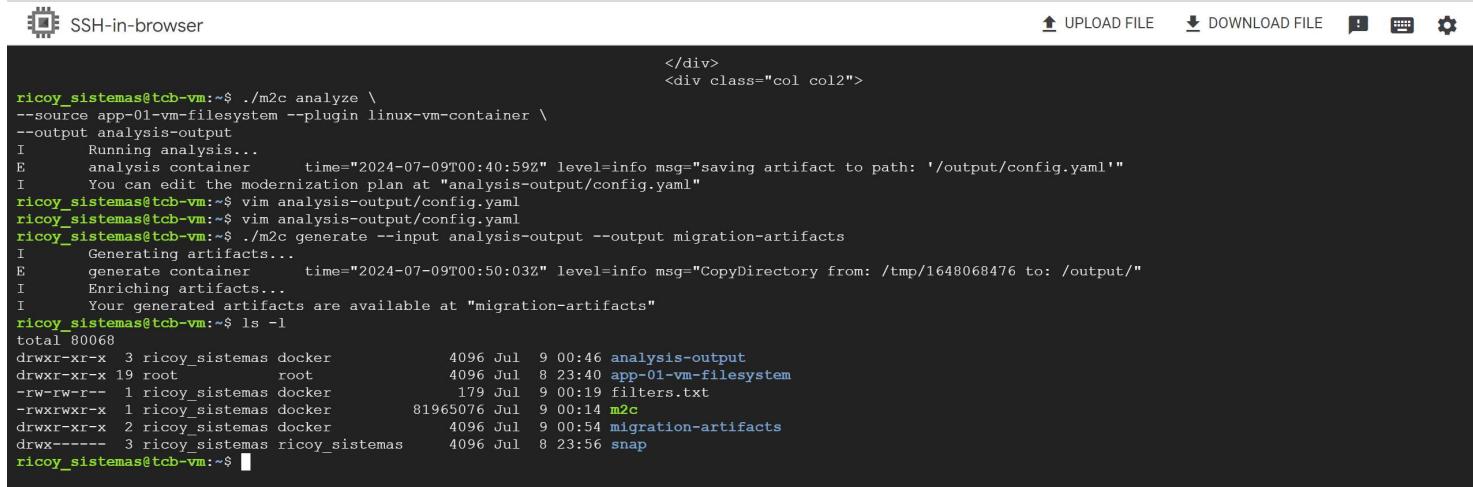


SSH-in-browser

global:
Files and directories to exclude from the migration, in rsync format.
filters:
- '- *.swp'
- '- /etc/Fstab'
- '- /boot/'
- '- /proc/kcore'
- '- /tmp/*'
- '- /var/log/*.*log*'
- '- /var/log/faillog'
- '- /var/log/lastlog'
- '- /var/log/[wb]tmp*'
- '+ /var/cache/**/
- '- /var/cache/*'
- '- /var/log/journal/'
- '- /var/m4a/*'
The data folders below are too big to be included in the docker image.
Consider uncommenting and including these either under the "global" filters or the data folder section.
- '- /snap/google-cloud-cli/223' # (1.5 GB, last access 2024-07-09 00:24:22, last modified 2024-03-12 13:48:42)
- '- /snap/google-cloud-cli/223' # (1.5 GB, last access 2024-07-09 00:24:22, last modified 2024-03-12 13:48:42)
- '- /snap' # (2.9 GB, last access 2024-07-09 00:24:56, last modified 2024-04-24 16:47:22)
- '- /usr' # (1.3 GB, last access 2024-07-09 00:25:44, last modified 2024-07-08 23:47:17)
- '- /var/lib/snapd' # (1.3 GB, last access 2024-07-09 00:26:04, last modified 2024-07-08 23:50:34)
- '- /var/lib/' # (1.6 GB, last access 2024-07-09 00:26:05, last modified 2024-07-09 00:22:55)
- '- /var' # (1.6 GB, last access 2024-07-09 00:33:51, last modified 2024-07-09 00:22:58)
image:
Review and set the name for runnable container image, if an image tag is not specified, a random tag will be
auto-generated when the image is built.
name: linux-system
systemServices:
- enabled: true
 name: apache2
 probed: false
- enabled: true

1,7 Top

Gerando os artefatos de migração



SSH-in-browser

```
ricoy_sistemas@tcb-vm:~$ ./m2c analyze \  
--source app-01-vm-filesystem --plugin linux-vm-container \  
--output analysis-output  
I      Running analysis...  
E      analysis container      time="2024-07-09T00:40:59Z" level=info msg="saving artifact to path: '/output/config.yaml'"  
I      You can edit the modernization plan at "analysis-output/config.yaml"  
ricoy_sistemas@tcb-vm:~$ vim analysis-output/config.yaml  
ricoy_sistemas@tcb-vm:~$ vim analysis-output/config.yaml  
ricoy_sistemas@tcb-vm:~$ ./m2c generate --input analysis-output --output migration-artifacts  
I      Generating artifacts...  
E      generate container      time="2024-07-09T00:50:03Z" level=info msg="CopyDirectory from: /tmp/1648068476 to: /output/"  
I      Enriching artifacts...  
I      Your generated artifacts are available at "migration-artifacts"  
ricoy_sistemas@tcb-vm:~$ ls -l  
total 80068  
drwxr-xr-x  3 ricoy_sistemas docker          4096 Jul  9 00:46 analysis-output  
drwxr-xr-x 19 root           root          4096 Jul  8 23:40 app-01-vm-filesystem  
-rw-rw-r--  1 ricoy_sistemas docker          179 Jul  9 00:19 filters.txt  
-rwxrwxr-x  1 ricoy_sistemas docker     81965076 Jul  9 00:14 m2c  
drwxr-xr-x  2 ricoy_sistemas docker          4096 Jul  9 00:54 migration-artifacts  
drwx----- 3 ricoy_sistemas ricoy_sistemas    4096 Jul  8 23:56 snap  
ricoy_sistemas@tcb-vm:~$ █
```

Criação do cluster GKE

```

tcb-m2c-428201) ~ ricoy_sistemas@cloudshell:~ (tcb-m2c-428201)$ gcloud container clusters create app-01-cluster --project=$DEVSHELL_PROJECT_ID \
--zone=us-west1-a --machine-type=n1-standard-4 --release-channel=stable \
--image-type ubuntu_containerized --num-nodes 1 --logging=SYSTEM --monitoring=SYSTEM \
--subnetwork "projects/$DEVSHELL_PROJECT_ID/regions/us-west1/subnetworks/default"
Default change: VPC-native is the default mode during cluster creation for versions greater than 1.21.0-gke.1500. To create advanced routes based clusters, please pass the '--no-enable-ip-alias' flag
Note: The Kubelet readonly port (10255) is now deprecated. Please update your workloads to use the recommended alternatives. See https://cloud.google.com/kubernetes-engine/docs/how-to/disable-kubelet-readonly-port for ways to check usage and for migration instructions.
Note: Modifications on the boot disks of node VMs do not persist across node recreations. Nodes are recreated during manual-upgrade, auto-upgrade, auto-repair, and auto-scaling. To preserve modifications across node recreation, use a DaemonSet.
Note: Your Pod address range ('--cluster-ipv4-cidr') can accommodate at most 1008 node(s).
Creating cluster app-01-cluster in us-west1-a... Cluster is being health-checked (master is healthy)...done.
Created [https://container.googleapis.com/v1/projects/tcb-m2c-428201/regions/us-west1-a/clusters/app-01-cluster].
To inspect the contents of your cluster, go to: https://console.cloud.google.com/kubernetes/workload_gcloud/us-west1-a/app-01-cluster?project=tcb-m2c-428201
kubeconfig entry generated for app-01-cluster.
NAME: app-01-cluster
LOCATION: us-west1-a
MASTER VERSION: 1.27.13-gke.1070002
MASTER_IP: 34.127.102.38
MACHINE_TYPE: n1-standard-4
NODE VERSION: 1.27.13-gke.1070002
NUM_NODES: 1
STATUS: RUNNING
ricoy_sistemas@cloudshell:~ (tcb-m2c-428201)$

```

Google Cloud tcb-m2c Search (/) for resources, docs, products, and more [Search](#)

Kubernetes Engine Kubernetes clusters [CREATE](#) [DEPLOY](#) [REFRESH](#) [ONBOARDING](#) [OPERATIONS](#) [LEARN](#)

[Learn about Enterprise](#)

All Fleets

Resource Management

- Overview
- Clusters**
- Workloads
- Teams
- Applications
- Secrets & ConfigMaps

Marketplace

Release Notes

Run your business critical workloads faster, safer, and easier at enterprise scale

GKE Enterprise combines multi-cluster and multi-team operations with fully managed security, governance, and service networking components. Enjoy all the benefits of GKE Standard along with the tools that secure workloads, enforce compliance policies, and provide application visibility with actionable insights and an application-aware network for resiliency.

When you're ready to scale beyond a single team or cluster, GKE Enterprise delivers an integrated and consistent way to configure, secure, protect, and monitor container workloads.

[LEARN AND ENABLE](#)

OVERVIEW		OBSERVABILITY	COST OPTIMIZATION		
Filter Enter property name or value					
Status	Name	Location	Number of nodes	Total vCPUs	Total memory
<input checked="" type="checkbox"/>	app-01-cluster	us-west1-a	1	4	15 GB

Instalação do plugin de autenticação do gcloud SDK para GKE

```

ricoy_sistemas@tcb-vm:~/migration-artifacts$ sudo apt-get install google-cloud-sdk-gke-gcloud-auth-plugin -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  google-cloud-cli-gke-gcloud-auth-plugin
The following NEW packages will be installed:
  google-cloud-cli-gke-gcloud-auth-plugin google-cloud-sdk-gke-gcloud-auth-plugin
0 upgraded, 2 newly installed, 0 to remove and 73 not upgraded.
Need to get 3230 kB of archives.
After this operation, 11.1 MB of additional disk space will be used.
Get:1 https://packages.cloud.google.com/apt cloud-sdk/main amd64 google-cloud-cli-gke-gcloud-auth-plugin amd64 483.0.0-0 [3225 kB]
Get:2 https://packages.cloud.google.com/apt cloud-sdk/main all google-cloud-sdk-gke-gcloud-auth-plugin all 467.0.0-0 [5018 B]
Fetched 3230 kB in 1s (5225 kB/s)
Selecting previously unselected package google-cloud-cli-gke-gcloud-auth-plugin.
(Reading database ... 112301 files and directories currently installed.)
Preparing to unpack .../google-cloud-cli-gke-gcloud-auth-plugin_483.0.0-0_amd64.deb ...
Unpacking google-cloud-cli-gke-gcloud-auth-plugin (483.0.0-0) ...
Selecting previously unselected package google-cloud-sdk-gke-gcloud-auth-plugin.
Preparing to unpack .../google-cloud-sdk-gke-gcloud-auth-plugin_467.0.0-0_all.deb ...
Unpacking google-cloud-sdk-gke-gcloud-auth-plugin (467.0.0-0) ...
Setting up google-cloud-cli-gke-gcloud-auth-plugin (483.0.0-0) ...
Setting up google-cloud-sdk-gke-gcloud-auth-plugin (467.0.0-0) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

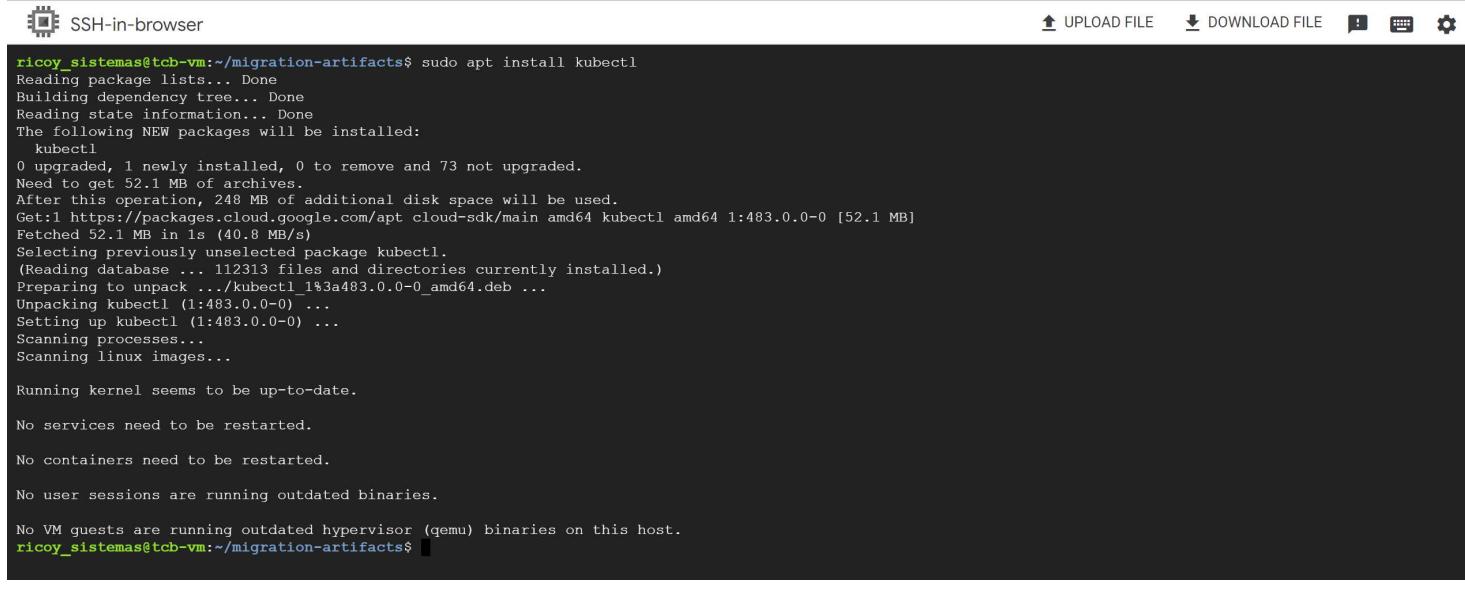
No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ricoy_sistemas@tcb-vm:~/migration-artifacts$ 

```

Instalação do kubectl



```

ricoy_sistemas@tcb-vm:~/migration-artifacts$ sudo apt install kubectl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  kubectl
0 upgraded, 1 newly installed, 0 to remove and 73 not upgraded.
Need to get 52.1 MB of additional disk space will be used.
After this operation, 248 MB of additional disk space will be used.
Get:1 https://packages.cloud.google.com/apt cloud-sdk/main amd64 kubectl amd64 1:483.0.0-0 [52.1 MB]
Fetched 52.1 MB in 1s (40.8 MB/s)
Selecting previously unselected package kubectl.
(Reading database ... 112313 files and directories currently installed.)
Preparing to unpack .../kubectl_1%3a483.0.0-0_amd64.deb ...
Unpacking kubectl (1:483.0.0-0) ...
Setting up kubectl (1:483.0.0-0) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

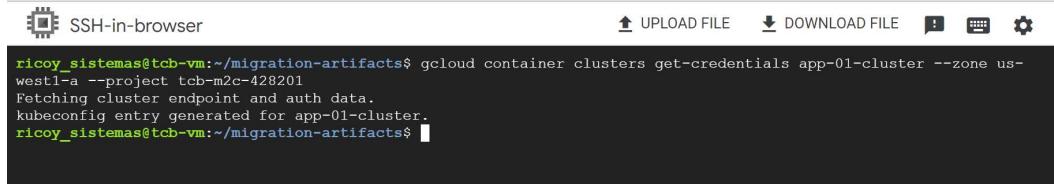
No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ricoy_sistemas@tcb-vm:~/migration-artifacts$ 

```

Configuração das credenciais de autenticação do GKE



```

ricoy_sistemas@tcb-vm:~/migration-artifacts$ gcloud container clusters get-credentials app-01-cluster --zone us-west1-a --project tcb-m2c-428201
Fetching cluster endpoint and auth data.
kubeconfig entry generated for app-01-cluster.
ricoy_sistemas@tcb-vm:~/migration-artifacts$ 

```

Visualização do .kube/config

```

ricoy_sistemas@tcb-vm:~/migration-artifacts$ cat ~/.kube/config
apiVersion: v1
clusters:
- cluster:
    certificate-authority-data: LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSUVMVENDOXBXZ0F3SUJBZ0lSQuxWkpBc2xkTnJqSXWVvaE9Rmt3RFZSktxWklodmNOQVFTEJRQXcKTHpFdElDcBMVVFQXhNa1pHrmrNekvTvdVe1tTTJaUzAwVRNNEXRX1LOVEV0TtJV
Mk5zGxaamxsWRZMwpNQQ0FYRFRJME1EY3dPRE15tKRZd09Gb11Eek13t1RRd056QXhNa0kwTmpBNFdqQXZNUzB3S3dZRFZRUURFeVJrC11XUpN
VE14WLMweV16WmxMFVJcTxpndf1USTfNUzB6W1R2RMX4yVm1PV1z0Tmpjd2dnR21NQTBHQ1NxR1NJYjMKRFFFQkFRVUFBNelCandBd2dnR0tBb01C
Z1FDd1VjT2NqYzhKR1Q0L2V0Vh3Nxg4U1VwZ0NnQ1tYT3dmazR2Lwp4aCt6a3ExQ1YxVvnvQXk0a3pnnNTZUFBpm251bm9PUkQ4N2o4b3FZYndv
WXdHcC9YNWw5dfdR23BpcpkUM1FFCmJWNKw3K2tud9CemW5X1r0u5acWpb0jzRVHZK2ZFG9jMEvhU05jZHfdmuy0tVnZU1Qd01GMm5oLZZZ
RWYSDZ3NzhztaTV5bElnUGU2M3AyYzJNR1BFRz2132jJoam5RV1NBY05vZEZOT2xhOdgovwNvVN3pFNmJnRUEl05h
Z211Y2FNSHLZTjZMytUSVpHRXQwbnVBRDE2WWxycHPwVU1WEJsUGV8uIn2R2xNCmxjeFdXVXhKVHpnVnd2bUEwbVJVNk1nRUNWL0dpbDV2c0Jw
eC93MXRqr2EB1lRuZ#W9-MzdMODJab0jzM1hRdmUKMkprdmFSUx0zJ1J2W5aKhPbEtjV1VhbXovNzBpcU1FczdwdkE4NUlyckVCMUVOWkxeu50
dwAtZStyr1JSTApTVjhsNmf120Nu1lVcm1IU2tRMkhmNY3Nk91ZjRvnnd3bngyRfd1SjB1dg95MVRQ0h1Wk1YWSstuQmVveUNDcnc3Vkd4S2hzq
dEp2MeJteDVMN3CYk92L205VNBd0VBQFO01FQxdE211EV1lwUEFRSC9CQVFEQwdjRU1BeOkcQTFEVZ3RU1vd1FGTUFNQkMh0hdIvIEV1Iw
TOJCUWVGSmJtZmtUbjM5cxXBSStJb0jGSm16bTcva3RQTUEwRpDU3FHU01iM0RRUJ5d1VBoTRj0mdrQW1qWeDceHdNzJna1u0UWt27311Ujji
TkpxMWhSNnF2aGh3ajNzQ21mCjYrdjhwtCTeKE3hKThzDTVZzN1N2dmFK5jAzSmvEeVFTRFh1KzRybXzDvZuJwXXvickNvajNOYi2VTg5eWtTnIK
cmJxYkxiUTkrUV1nNFH1dVFYhWdGa0pNMTRoWFPMnTb0gwZGdZdUE2S0NvY1Qrb1NmB1RZTh1qNkY0U1VOQwo0VjFTQn1hMGRyTrNzQ0ZTd2U4
eHK3eIRjL215Y01scEFPAVnuMpwvFnNy3B3QxdBdtskR0E4WG9TaUhQ09NcmdKNWZ1TVVvBxd5anZCwQtFODRYcm5haXBIMWV3Z1lVUElNaEW
czWSR8p3T3k1WU1QVER1exZTV1VVS1ZHK2cKT3lueloxR1krMmViT01EcitLMillaSlpkbfm50VJu21b2d1V0NUZKnmeNws3U2eXBMMUcraG5w
SU2ub0JzQpBWUQzTWNSUCsyK1dkQmdoR3diYU1xdWZ3d1MxdXJXbml4WFdPT1BIMHEwamVKYkt0V0tkm29JN3J3T0t3R3VkcMRYVUZXWWRPMUpS
UWJwdvJIek1LbTzvZ311cichenhjUnR5dUhIdg5DvWz1UtKwMGpzYitnbkRZOC95UuxPTU4KZ1NuZTzJtKzJl3R0bUQ1eUd2dn1LK1E9Ci0tLS0t
RU5EIEFNfulR0k1DQVRFLS0tLS0t

    server: https://34.127.10.38
  name: gke_tcb-m2c-428201_us-west1-a_app-01-cluster
contexts:
- context:
    cluster: gke_tcb-m2c-428201_us-west1-a_app-01-cluster

```

Adição do serviço de Load Balancer para permitir acessar a aplicação de fora do cluster

```

SSH-in-browser      UPLOAD FILE  DOWNLOAD FILE  🔍  📱  🛡  🚧
resources: {}

---
# Headless Service specification -
# No load-balancing, and a single cluster internal IP, only reachable from within the cluster
# The Kubernetes endpoints controller will modify the DNS configuration to return records (addresses) that point to the Pods, which are labeled with "app": "linux-system"
apiVersion: v1
kind: Service
metadata:
  creationTimestamp: null
  labels:
    anthos-migrate.cloud.google.com/type: linux-container
    migrate-for-anthos-optimization: "true"
    migrate-for-anthos-version: m2c-cli-1.2.2
  name: linux-system
spec:
  clusterIP: None
  selector:
    app: linux-system
  type: ClusterIP
  ---  

# Adding Load Balancer service for talent-management-portal
apiVersion: v1
kind: Service
metadata:
  name: talent-management-portal
spec:
  selector:
    app: linux-system
  ports:
    - protocol: TCP
      port: 80
      targetPort: 80
  type: LoadBalancer
  ---  

:x

```

Criação do Artifact Registry

```

SSH-in-browser      UPLOAD FILE  DOWNLOAD FILE  🔍  📱  🛡  🚧
ricoy_sistemas@tcb-vm:~/migration-artifacts$ gcloud artifacts repositories create linux-system-repo --repository-format=docker \
--location=us-west1 --description="Docker repository"
Create request issued for: [linux-system-repo]
Waiting for operation [projects/tcb-m2c-428201/locations/us-west1/operations/ccebc7501-f030-4770-bbdc-1eddc5d8e1cc] to complete...done.
Created repository [linux-system-repo].
ricoy_sistemas@tcb-vm:~/migration-artifacts$ 

```

Artifact Registry

Repositories

Turn on vulnerability scanning

Your registry is not being monitored for known vulnerabilities. GCP offers automatic vulnerability monitoring of all images pushed or pulled within the last 30 days at a cost of \$0.26 per image.

TURN ON **LEARN MORE**

Filter Enter property name or value

Name ↑	Format	Type	Location	Description	Labels	Version policy	Encryption	Encry
linux-system-repo	Docker	Standard	us-west1 (Oregon)	Docker...	-	-	Google-managed	-

Autenticação do Docker no repositório do Artifact Registry

SSH-in-browser

UPLOAD FILE **DOWNLOAD FILE**

```
ricoy_sistemas@tcb-vm:~/migration-artifacts$ gcloud auth configure-docker us-west1-docker.pkg.dev
Adding credentials for: us-west1-docker.pkg.dev
After update, the following will be written to your Docker config file
located at [/home/ricoy_sistemas/.docker/config.json]:
{
  "credHelpers": {
    "us-west1-docker.pkg.dev": "gcloud"
  }
}
Do you want to continue (Y/n)? Y
Docker configuration file updated.
ricoy_sistemas@tcb-vm:~/migration-artifacts$
```

Deploy dos artefatos criados no repositório do Artifact Registry e no cluster do GKE

SSH-in-browser

UPLOAD FILE **DOWNLOAD FILE**

```
5649454e8fd1: Preparing
05582e5ad3c8: Preparing
0e425b1b4db6: Preparing
6f8744178d6a: Preparing
c6313651b992: Preparing
c6313651b992: Waiting
0e425b1b4db6: Pushed
5649454e8fd1: Pushed
566bb7bc57db: Pushed
05582e5ad3c8: Pushed
6f8744178d6a: Pushed
c6313651b992: Pushed
latest: digest: sha256:299a183c251bddabf538f20983708127b342338ba59bfeae5c7f7b
9bb7382d23 size: 1571
Build [linux-system] succeeded
Starting test...
Tags used in deployment:
- linux-system -> us-west1-docker.pkg.dev/tcb-m2c-428201/linux-system-repo/1
linux-system:latest@sha259a183c251bddabf538f20983708127b342338ba59bfeae5c7
f7b9bb7382d23
Starting deploy...
- deployment.apps/linux-system created
- service/linux-system created
- service/talent-management-portal created
Waiting for deployments to stabilize...
- deployment/linux-system: creating container linux-system
  - pod/linux-system-78c8984fdf-r1wh9: creating container linux-system
  - deployment/linux-system is ready.
Deployments stabilized in 1 minute 45.377 seconds
You can also run [skaffold run --tail] to get the logs

Help improve Skaffold with our 2-minute anonymous survey: run 'skaffold survey'
To help improve the quality of this product, we collect anonymized usage data
for details on what is tracked and how we use this data visit <https://skaffold.dev/docs/resources/telemetry/>. This data is handled in accordance with our privacy policy <https://policies.google.com/privacy>

You may choose to opt out of this collection by running the following command
:
  skaffold config set --global collect-metrics false
ricoy_sistemas@tcb-vm:~/migration-artifacts$
```

Recursos criados no cluster do GKE

```
SSH-in-browser
ricoy_sistemas@tcb-vm:~/migration-artifacts$ kubectl get all
NAME                                READY   STATUS    RESTARTS   AGE
pod/linux-system-78c8984fdf-rlwh9   1/1     Running   0          4m29s

NAME                            TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)    AGE
service/kubernetes             ClusterIP   10.72.224.1 <none>       443/TCP    114m
service/linux-system            ClusterIP   None         <none>       443/TCP    4m29s
service/talent-management-portal LoadBalancer 10.72.228.23 35.199.153.54 80:32526/TCP 4m29s

NAME           READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/linux-system-78c8984fdf  1/1      1           1          4m30s

NAME        DESIRED   CURRENT   READY   AGE
replicaset.apps/linux-system-78c8984fdf  1         1         1          4m29s
ricoy_sistemas@tcb-vm:~/migration-artifacts$
```

Acesso à aplicação migrada para o cluster

The screenshot shows a web browser window with the URL <http://35.199.153.54>. The page title is "Talent Management Portal" by Cloud Consulting. The main heading is "Talent Management Portal". Below it, a subtext says "How to contact the Talent Management team? Just click on Learn More." A red "Learn More" button is centered on the page. The browser's address bar shows the URL. The bottom of the screen displays a Windows taskbar with various icons for applications like File Explorer, Google Chrome, and Microsoft Word.