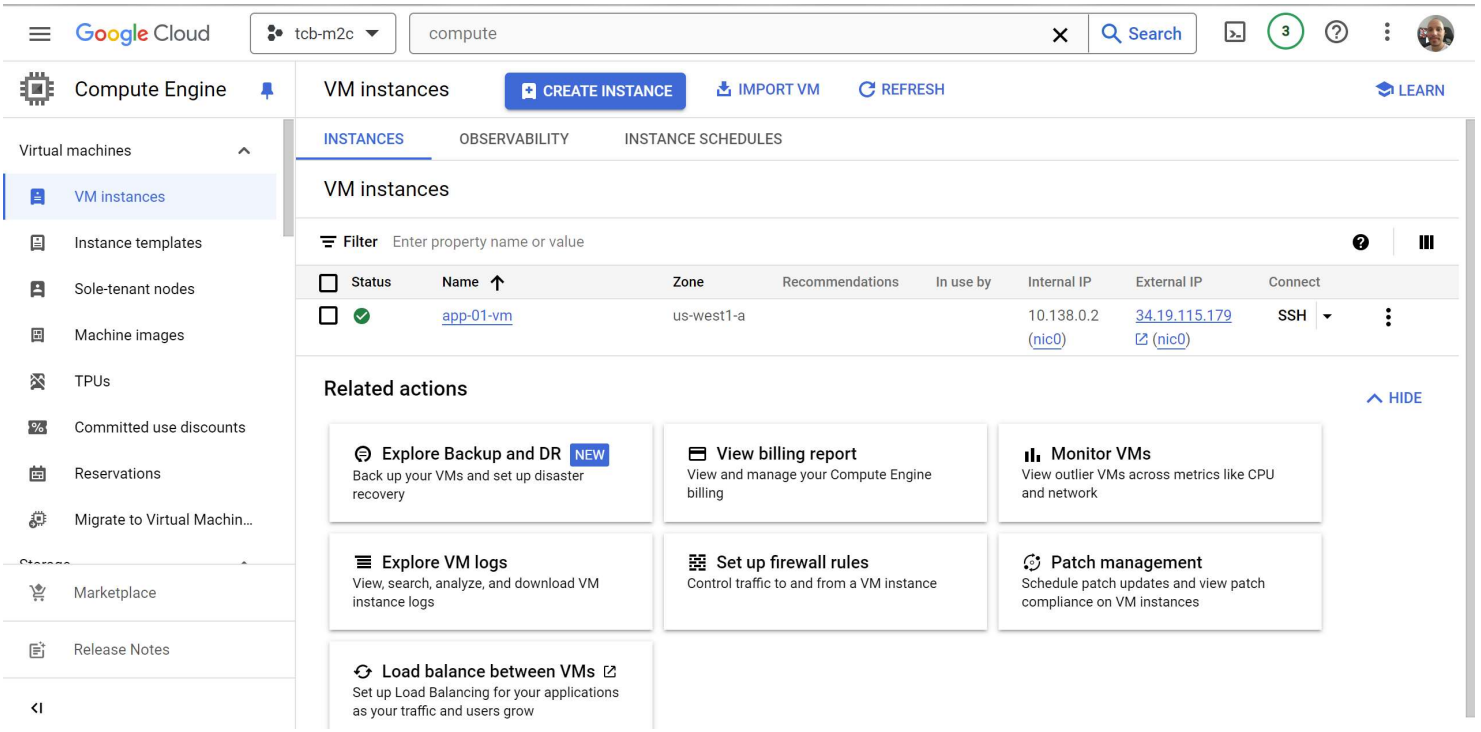
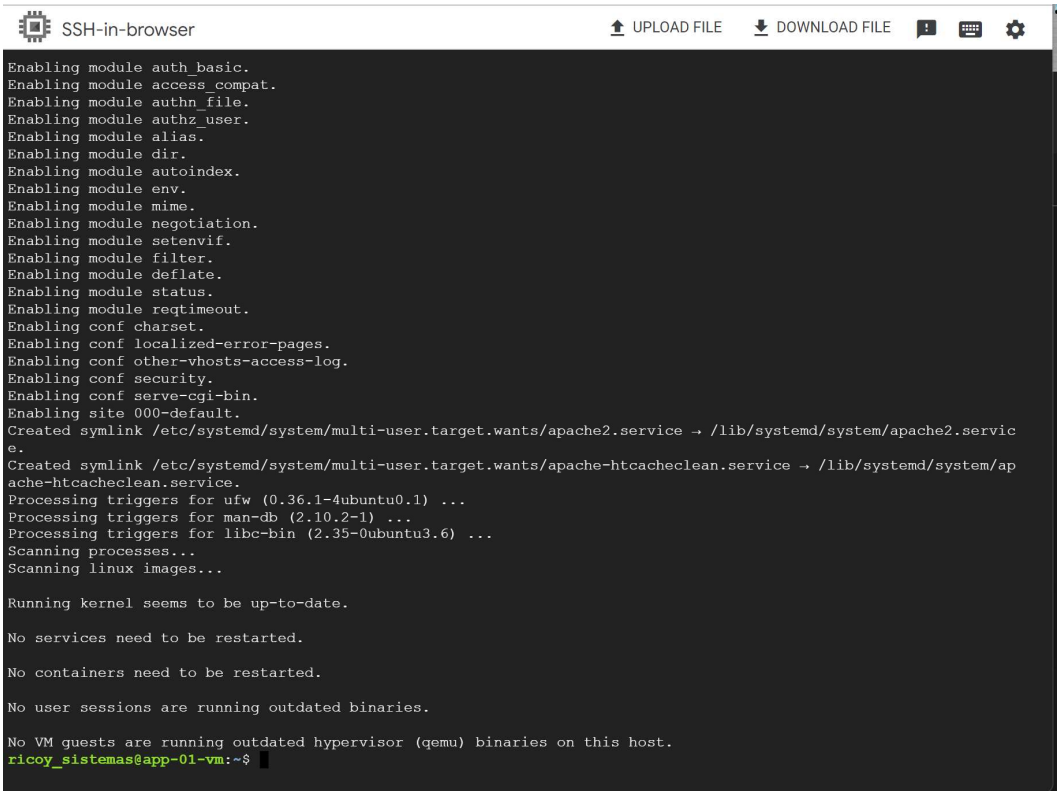
Gcloud - Módulo 4 | Lift & Shift + Modernização de Aplicação - Rodrigo Marques

terça-feira, 2 de julho de 2024 21:05

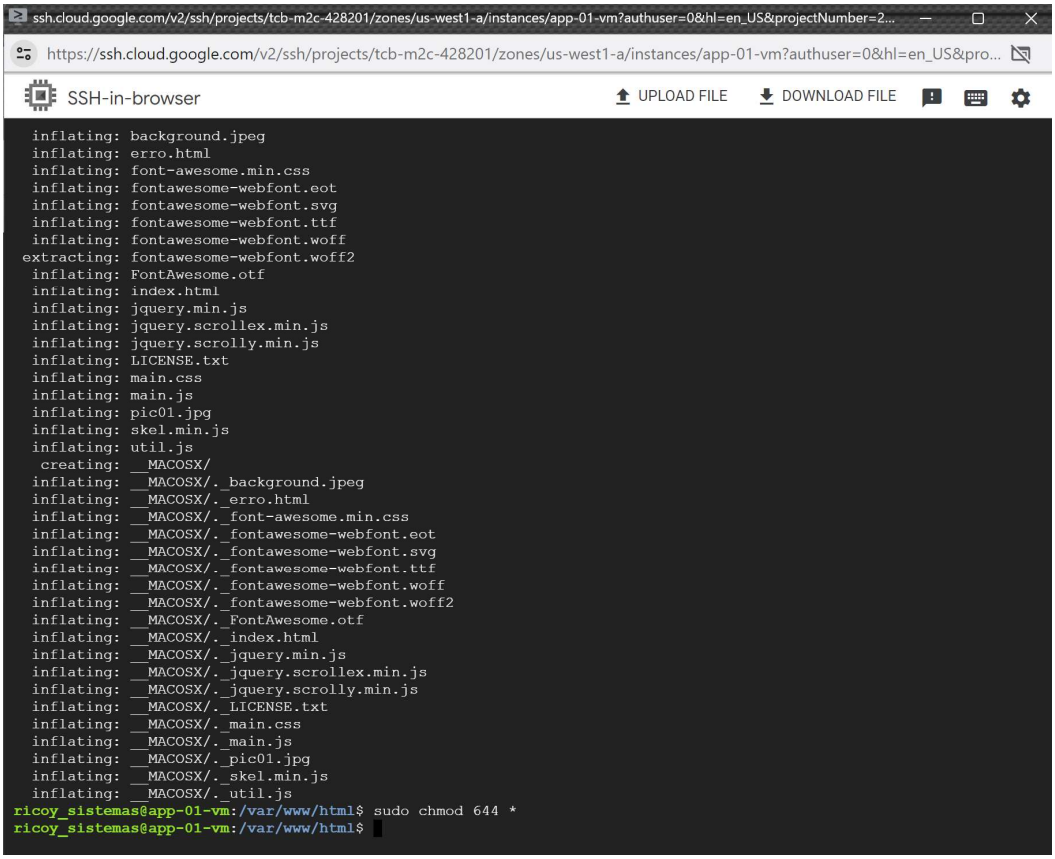
Criação da instância Lift & Shift



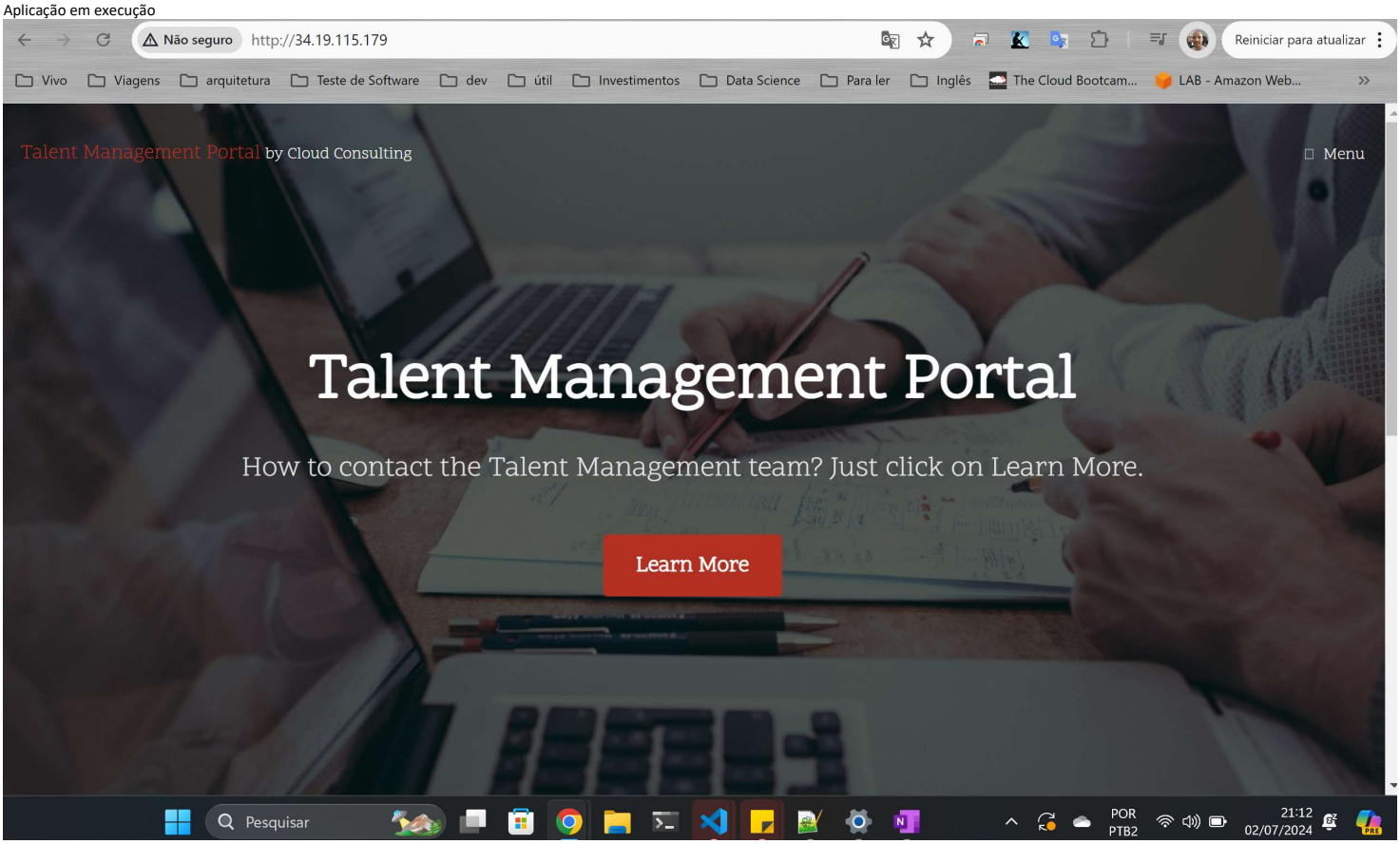
Instalação apache



Configuração da aplicação

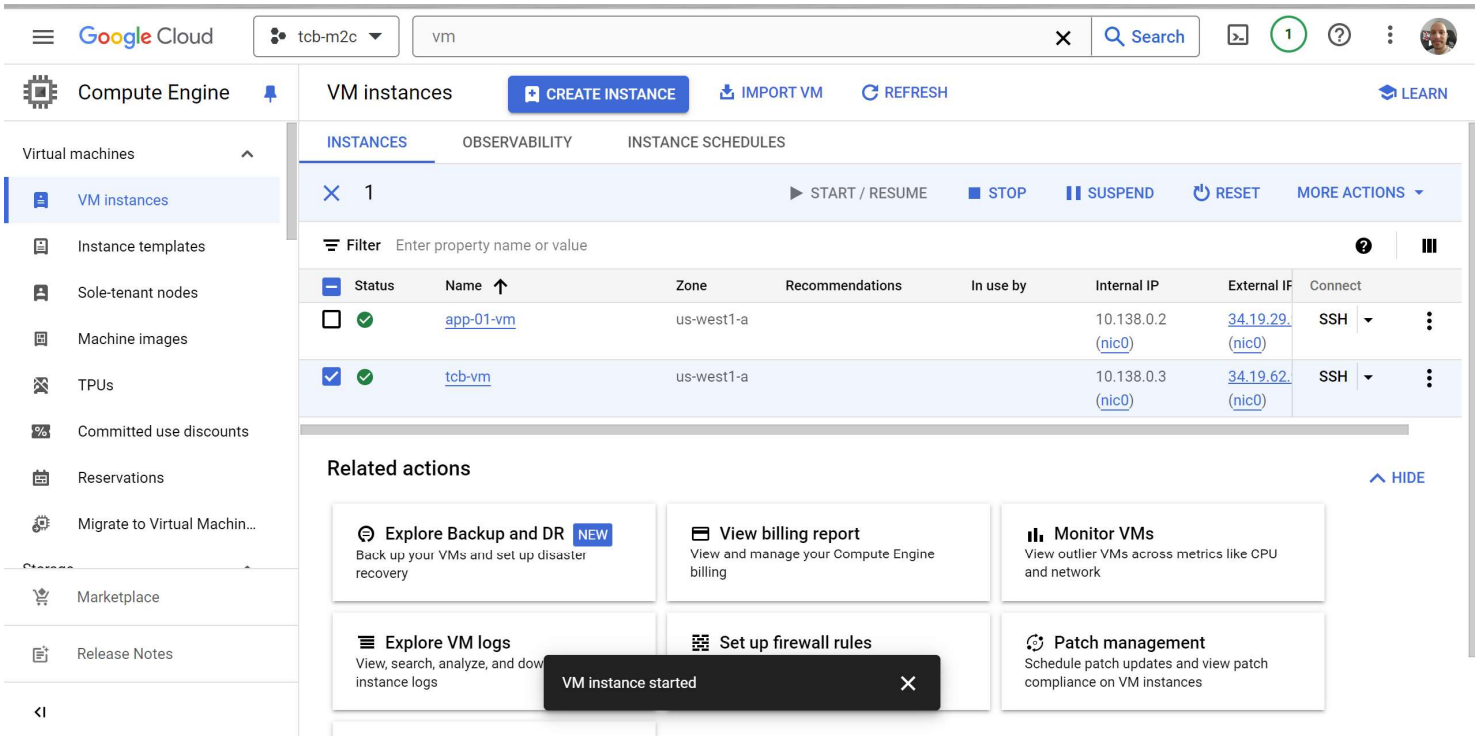


Aplicação em execução

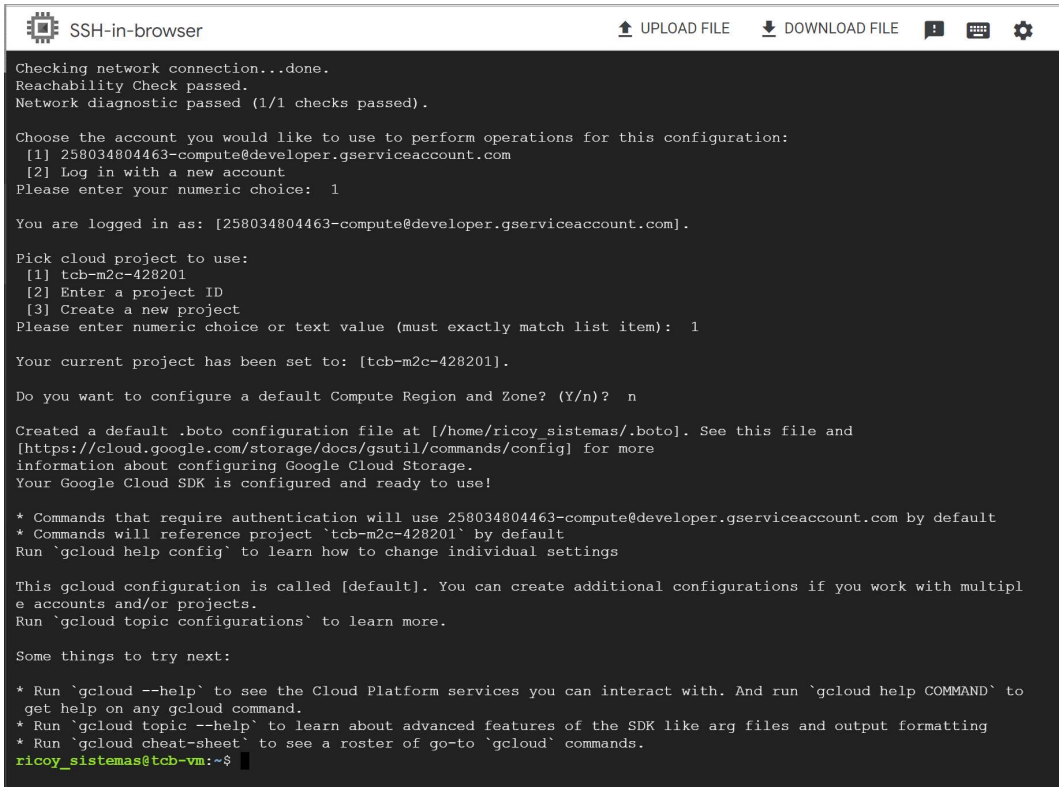


Criação da instância para execução do processo de migração

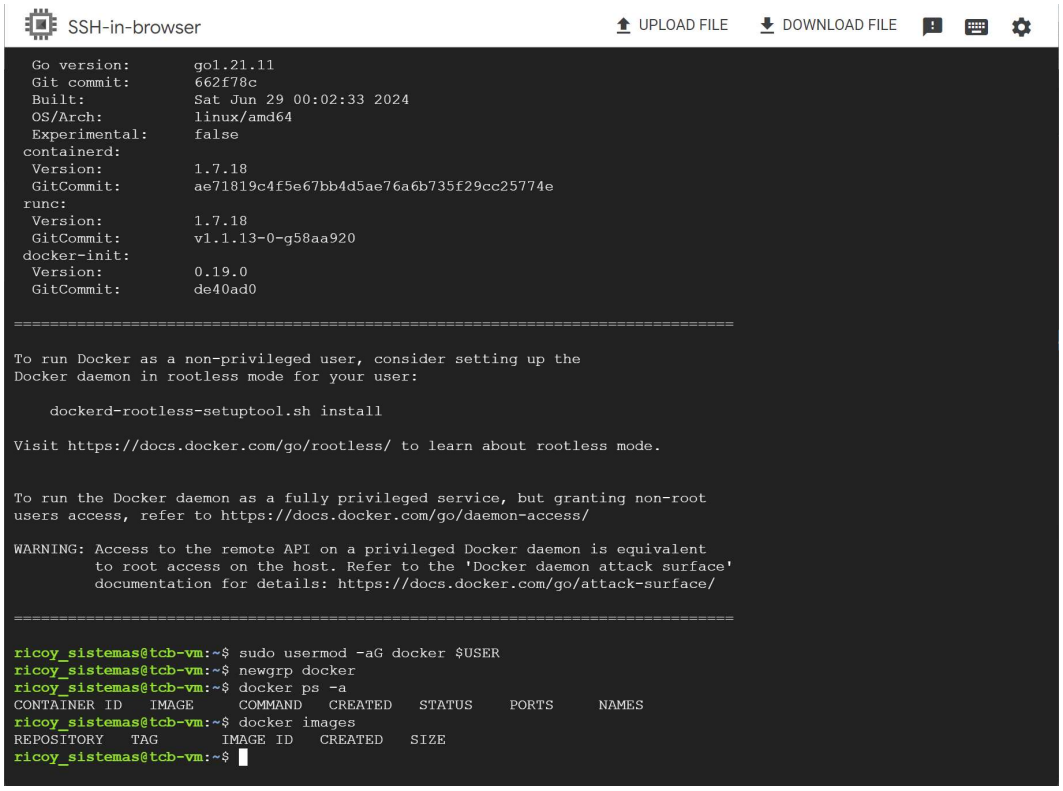
```
ricoy_sistemas@cloudshell:~ (tcb-m2c-428201)$ gcloud compute instances create tcb-vm \
  --zone=us-west1-a --machine-type=e2-medium  \
  --subnet=default --scopes="cloud-platform" \
  --tags=http-server,https-server --image=ubuntu-2204-jammy-v20240319 \
  --image-project=ubuntu-os-cloud --boot-disk-size=50GB --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 deta
ils.
 - The resource 'projects/ubuntu-os-cloud/global/images/ubuntu-2204-jammy-v20240319' is deprecated. A suggested replacement is 'pr
ojects/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)$
```



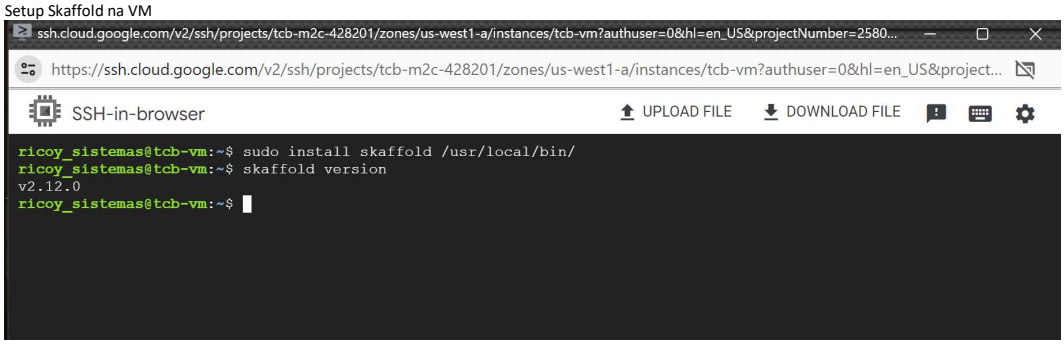
Setup das ferramentas na VM



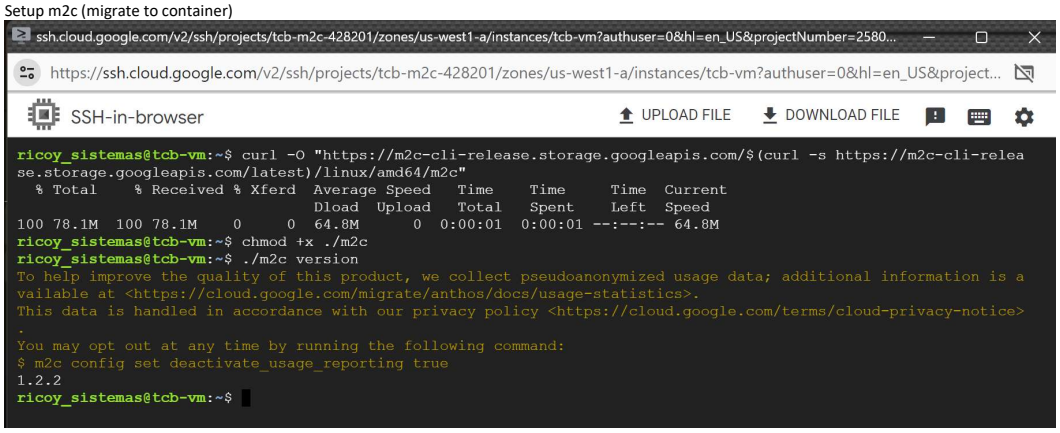
Setup do Docker na VM



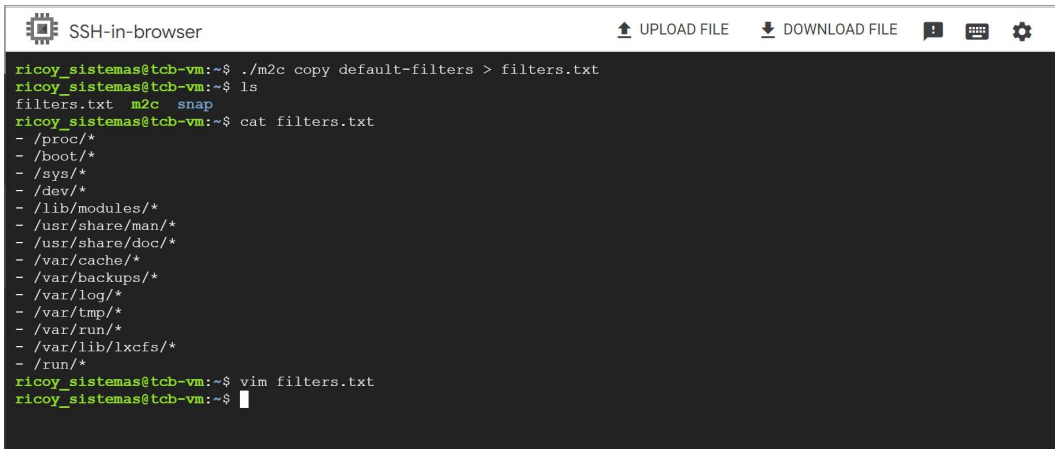
Setup Skaffold na VM



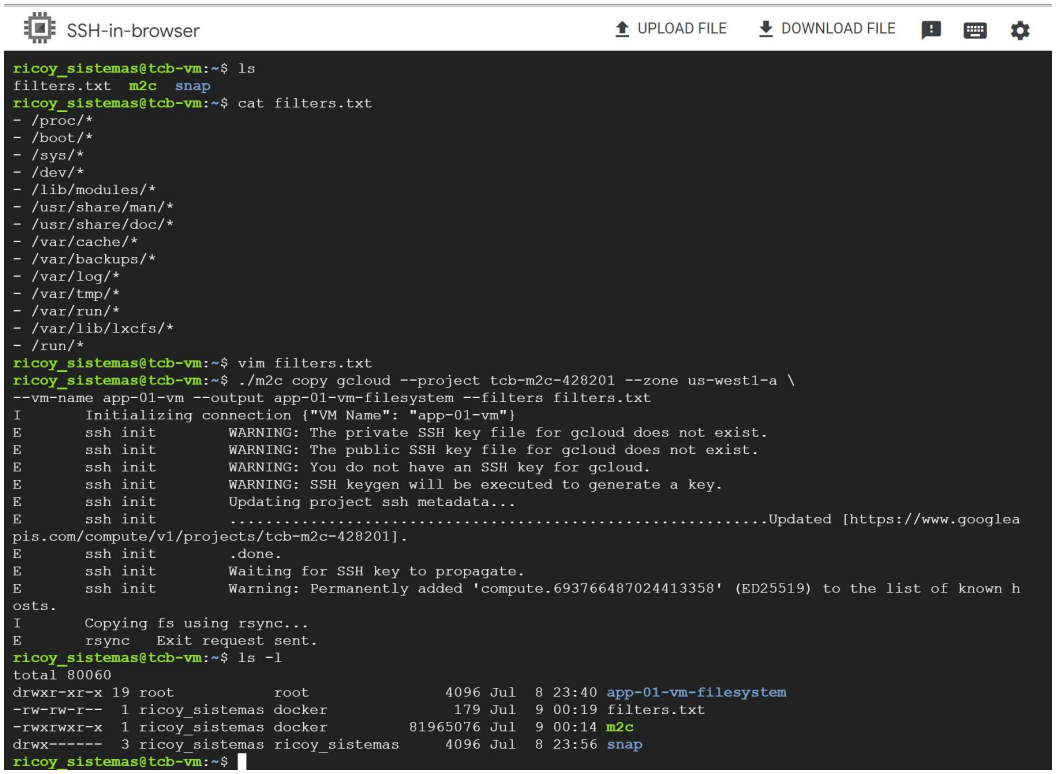
Setup m2c (migrate to container)



Criação de filtro para cópia de sistema de arquivos da VM



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



Criação do plano de migração do filesystem

Resultado da análise do plano de migração

SSH-in-browser UPLOAD FILE DOWNLOAD FILE

```
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/*/*.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' # (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

  # Disable system services that do not need to be executed at the migrated workload containers.
  # Enable the 'probed' property to include system services in the container health checks.
  systemServices:
  - enabled: true
    name: apache2
    probed: false
  - enabled: true
                                                                                1,7           Top
```

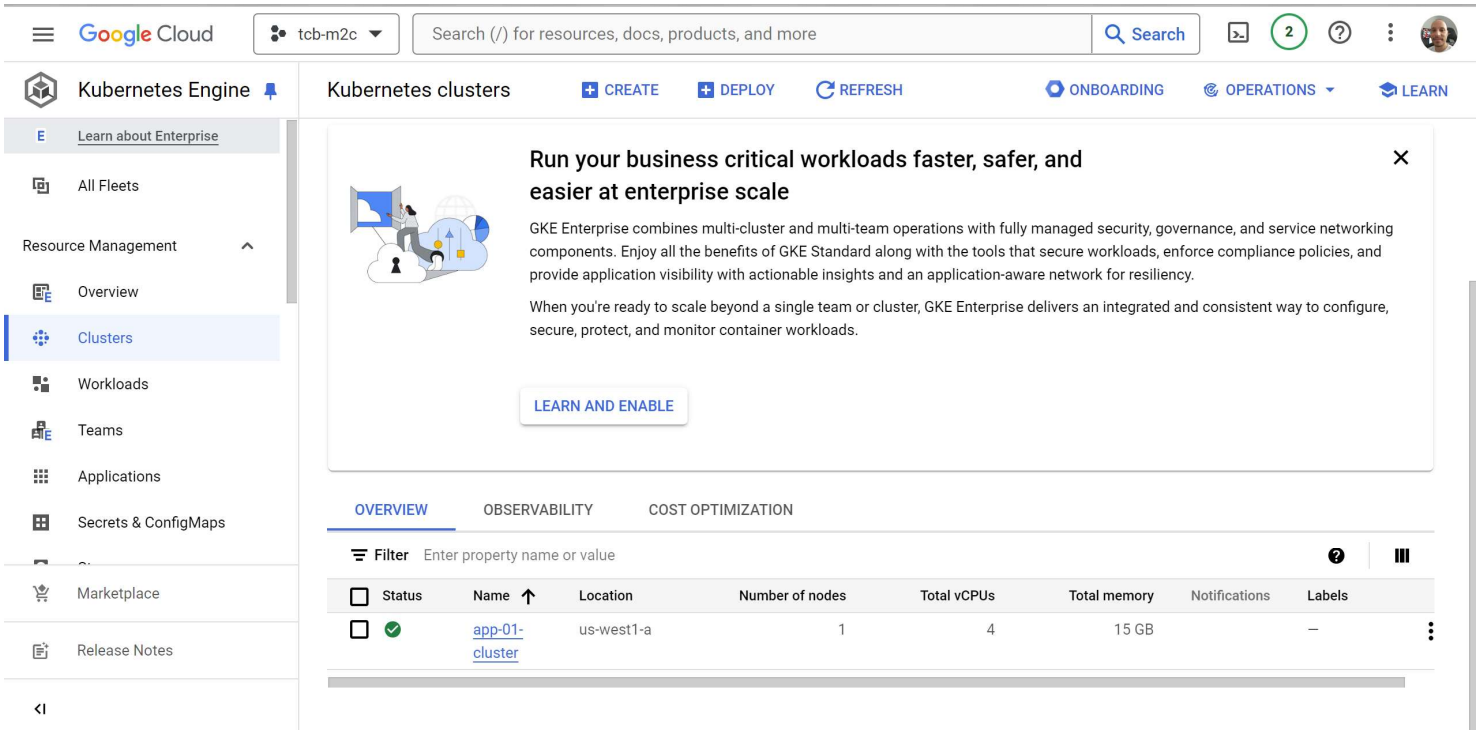
Gerando os artefatos de migração

SSH-in-browser UPLOAD FILE DOWNLOAD FILE

```
                                                        </div>
                                                        <div class="col col2">
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

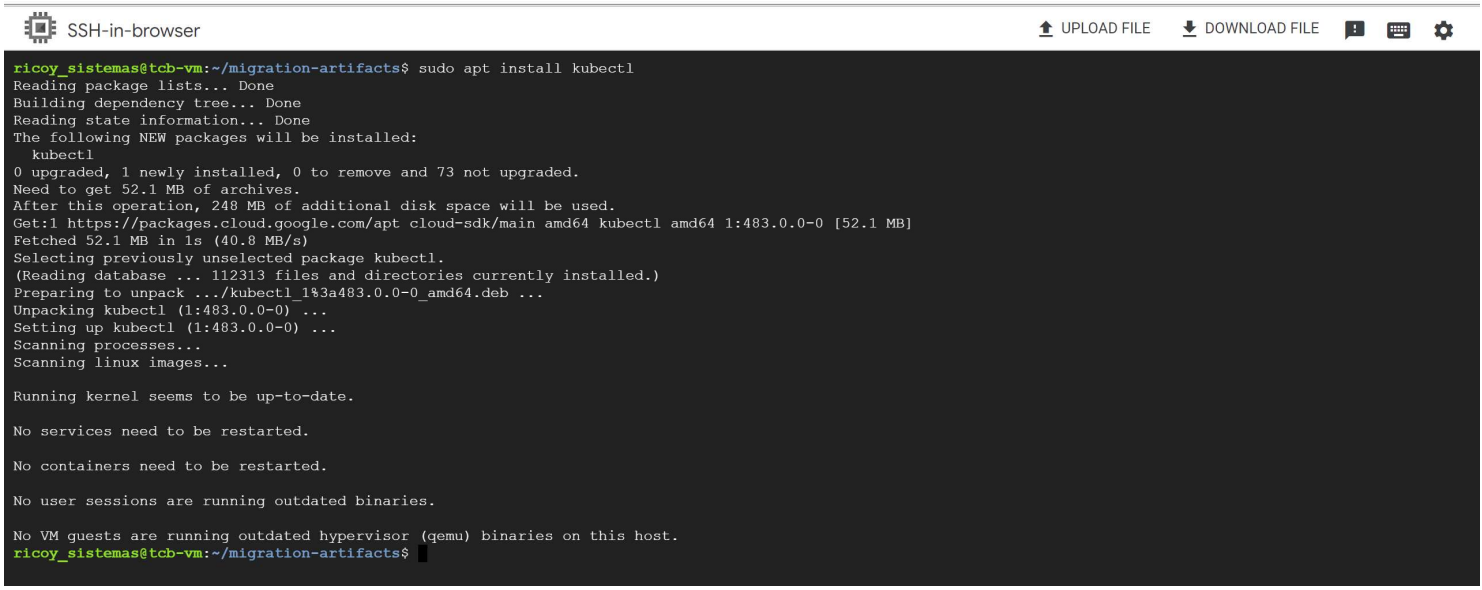
```
(tcb-m2c-428201)
ricoy_sistemas@cloudshell:~ (tcb-m2c-428201)$ gcloud container clusters create app-01-cluster --project=$DEVSHELL_PROJECT_ID \
--zone=us-west1-a --machine-type n1-standard-4 --release-channel=stable \
--image-type ubuntu_containerd --num-nodes 1 --logging=SYSTEM --monitoring=SYSTEM \
--subnetwork "projects/$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/zones/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)$
```



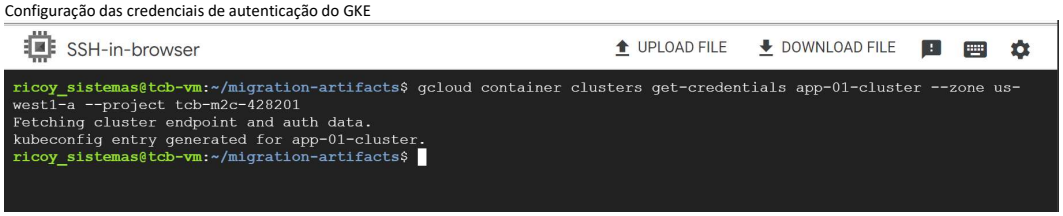
Instalação do plugin de autenticação do gcloud SDK para GKE

```
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



Configuração das credenciais de autenticação do GKE



Visualização do .kube/config

```
ricoy_sistemas@tcb-vm:~/migration-artifacts$ cat ~/.kube/config
apiVersion: v1
clusters:
- cluster:
    certificate-authority-data: LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSUVMVENDQXBXZ0F3SUJBZ01SQUxvWkpBc2xkTnJq
SXM4WVVvaE9rRmt3RFFZSktvWklodmNOQVFFTEJRQXcKTHpFdE1Dc0dBMVVFQXhNa1pHRmtNekV5TVdVdE1tTTJaUzAwWVRNNExXRXlOVEV0TTJV
Mk5qZGxaamxsWVRZMwpNQ0FYRFRJME1EY3dPRE15TkRZd09Gb1lEekl3T1RRd056QXhNak0wTmpBNFdqQXZNUzB3S3dZRFZRUURFeVJrC1lXUXpN
VEl4WlMweVl6WmxMVFJoTXpndFlUSTFNUzB6WlRZMk4yVm1PV1ZoTmpjd2dnR2lNQTBHQ1NxR1NJYjMKRFFFQkFRVUFBNElCandBd2dnR0tBb0lC
Z1FDdlVjT2NqYzhKRlQ0L2V0VHh3NXg4UlVwZ0NnQTlYT3dmazR2Lwp4aCt6a3ExQlYxVVNvQXk0a3pnNTNZUFBpM25lbm9PUkQ4N2o4b3FZYndv
WXdHcC9YNWV5dFdRZ3BpckpUM1FFCmJWNkw3K2tJdk9CemVWSXIrOU5acWJpb0JzRVZHK2ZFbG9jMEVhU05jZHFOdmUyOTVnZU1Qd01GMm5oL2ZZ
RWYKSDZ3NzhxaTV5bElnUGU2M3AyYzJNRjBFYkhGVjdXeXFCQmRvN1ViRDRzd2I3ZjJoam5RVlNBY05vZEZOT2xOdgovWnVWN3pFNmJnRUlELO5h
Z211Y2FNSHlZTjZJMytUSVpHRXQwbnVBRDE2WWxYcHpwVUlIWEJsUGVsUnc2R2xNCmxjeFdXVXhKVHpnVnd2bUEwbVJVNk1nRUNWL0dpbDV2c0Jw
eC93MXRrQ2tEb1RuZW9rMzdMODJab0JzMlhRdmUKMkprdmFSUUxoZjlJZW5WakhPbEtjV1VhbXovNzBPcU1FczdWdkE4NUIyckVCMUVOWkxveU5O
dWdtZStyR1JSTApTVjhSNmF1Q0Nud1lvcmlIU2tRMkhmNkY3Nk9iZjRvNnd3bngyRFdYSjBidG95MVRCQ0hiWk1YWStUQmVveUNDCnc3Vkd4S2hq
dEp2MEJteDVMN3ZCYk9ZL205VUNBd0VBQWFOQ01FQXdEZ11EV1IwUEFRSC9CQVFEQWdJRU1BOEcKQTFVZEV3RUIvd1FGTUFNQkFmOHdIUVlEVlIw
T0JCWUVGSmJTZmtUbjM5cXBBSStJb0JGSm16bTcva3RQTUEwRwpDU3FHU0liM0RRRUJDd1VBQTRJQmdRQW1qWEdCeHdNZnJna1U0UWt2T31IUjJi
TkpxMWhSNnF2aGh3ajNzQ21mCjYrdjhwTCtEK3hKTnZDTVZrNlN2dmFKSjAzSmVEeVFTRFhlKzRybXhZdVZuWXVickNVajNOYit2VTg5eWtvTnIK
cmJxYkxiUTkrUVlnNFhTdVFYWndGa0pNMTRoVWFPMnZTb0gwZGdZdUE2S0NVY1QrblNMb1RZTHlqNkY0U1VOQwo0VjFTQnlhMGRyTnNzQ0ZTdzU4
eHk3eHRjL2I5Y0lscEFPaVNuM1pwVFNyY3B3QXdDdStkR0E4WG9TaUhWQ09NCmdKNWZ1TVVVbXd5anZVcWtFODRYcm5haXBHMWV3Z1lVUElNaEVW
czVSREp3T3k1WU1QVER1eXZTV1VYS1ZHK2cKT3lueloxR1krMmViT01EcitLMllaS1pKblFmS0VJU2U1b2dlV0NUZkNmemNwS3U2eXBMMUcraG5w
SUZub0JzMQpBWUQzTWNSUCsyK1dkQmdOR3diYUlxdWZ3d1MxdXJXbml4WFdPT1BIMHEwamVKYkt0V0tkM29JN3J3T0t3R3VkCmRYVUZXYWRPMUpS
UWJwdVJIeklLbTZvZ3I1cithcnhjUnR5dUhIdG5DVWZlUTkwMGpzYitnbkRZOC95UUxPTU4KZ1NuZTZJTkZjL3R0bUQ1eUd2dnlLK1E9Ci0tLS0t
RU5EIENFUlRJRklDQVRFLS0tLS0K
    server: https://34.127.102.38
  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

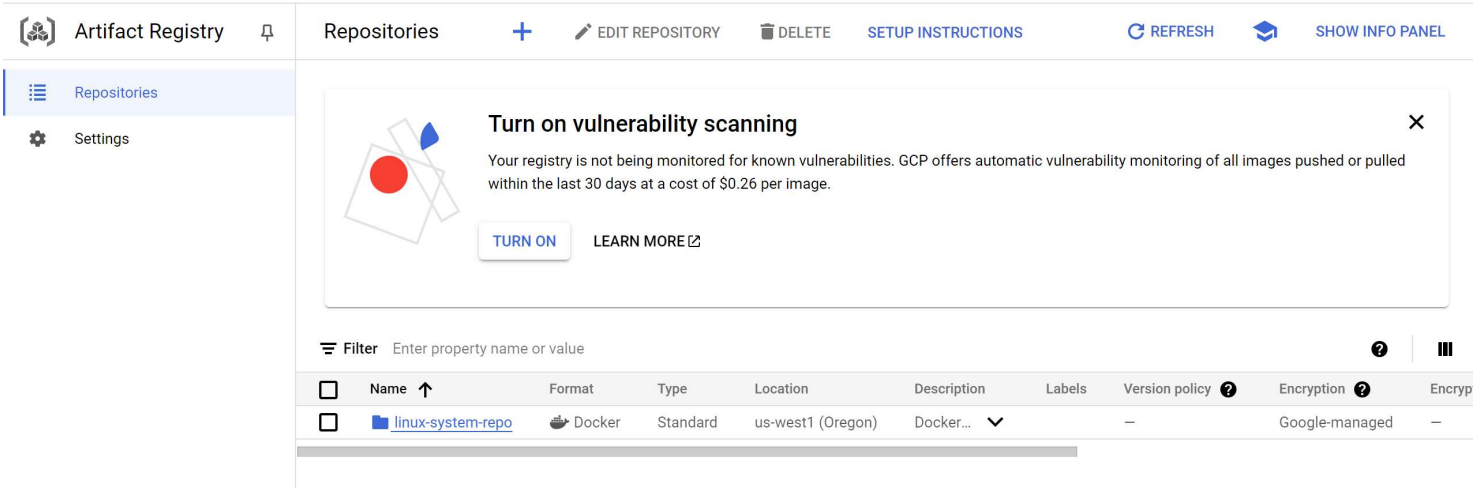
SSH-in-browser UPLOAD FILE DOWNLOAD FILE

```
        resources: {}

---
# Headless Service specification -
# No load-balancing, and a single cluster internal IP, only reachable from wi
thin the cluster
# The Kubernetes endpoints controller will modify the DNS configuration to re
turn 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
```

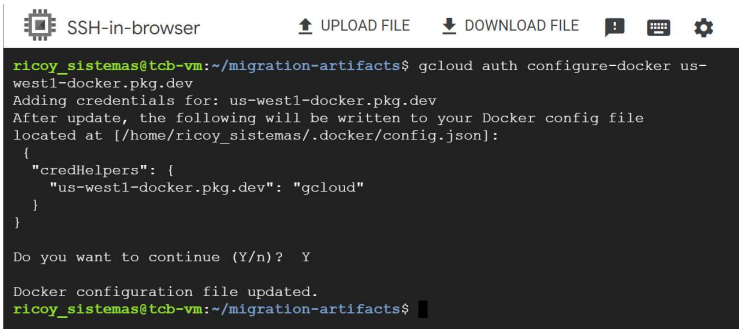
Criação do Artifact Registry

SSH-in-browser UPLOAD FILE DOWNLOAD FILE

```
ricoy_sistemas@tcb-vm:~/migration-artifacts$ gcloud artifacts repositories cr
eate 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
/cebc7501-f030-4770-bbdc-1eddcd58e1cc] to complete...done.
Created repository [linux-system-repo].
ricoy_sistemas@tcb-vm:~/migration-artifacts$
```



Autenticação do Docker no repositório do Artifact Registry



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

Recursos criados no cluster do GKE

```
SSH-in-browser                                   UPLOAD FILE   DOWNLOAD FILE

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>          <none>         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   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