Spinnaker on Cloud

28 January 2021 06:25

Installation on Google Kubernetes Engine (GKE) and setup pipeline

Requirement :

- Machine on which to install Halyard
- This can be a **local machine or VM (Ubuntu 14.04/16.04, Debian, or macOS), or it can be a Docker container**. Make sure it has at least 12GB of memory.
- A Kubernetes cluster on which to install Spinnaker itself. Recommendation: at least 4 cores and 16GB RAM

Process :

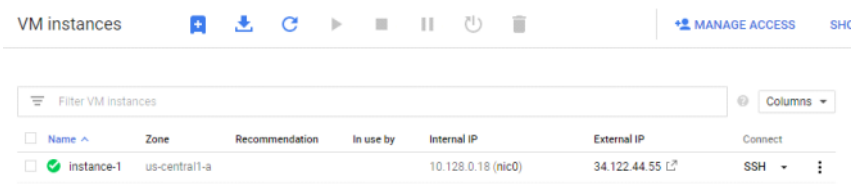
We will install Spinnaker by following below steps. Firstly we will install Halyard then choose cloud provider and choose an environment, choose storage server and finally Deploy Spinnaker.

1) **Install Halyard CLI**
2) **Choose a cloud provider**
3) **Choose an environment**
4) **Choose a storage service**
5) **Deploy Spinnaker.**
6) **Connect UI**

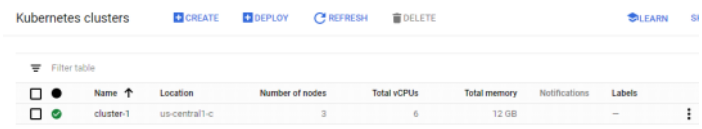
1. Install Halyard

a) In this implementation we will create Ubuntu machine and install halyard on that.

Create Ubuntu instance of 18.04 LTS and having configuration 4 vCPU and 16GB RAM



Create cluster in GCP



Halyard requires Java 11 to be installed

sudo apt-get update
sudo apt-get install openjdk-11-jdk

```
[redacted]@instance-1:~$ sudo apt-get update
Hit:1 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:4 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:5 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic/universe amd64 Packages [8570 kB]
Get:6 http://archive.canonical.com/ubuntu bionic InRelease [10.2 kB]
Get:7 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic/universe Translation-en [4941 kB]
Get:8 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic/multiverse amd64 Packages [151 kB]
Get:9 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic/multiverse Translation-en [108 kB]
```

```
[redacted]@instance-1:~$ sudo apt-get install openjdk-11-jdk
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libnuma1
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  at-spi2-core ca-certificates-java fontconfig-config fonts-dejavu-core fonts-dejavu-extra java-common libasound2
  libasound2-data libatk-bridge2.0-0 libatk-wrapper-java libatk-wrapper-java-jni libatk1.0-0 libatk1.0-data
  libatspi2.0-0 libavahi-client3 libavahi-common-data libavahi-common3 libcups2 libdrm-amdgpu1 libdrm-intel1
  libdrm-nouveau2 libdrm-radeon1 libfontconfig1 libfontenc1 libgif7 libgl1 libgl1-mesa-dri libglapi-mesa
  libglvnd0 libglx-mesa0 libglx0 libice-dev libice6 libjpeg-turbo8 libjpeg8 liblcms2-2 libllvm10 libpciaccess0
  libpcsclite1 libpthread-stubs0-dev libsensors4 libsm-dev libsm6 libx11-dev libx11-doc libx11-xcb1 libxau-dev
  libxaw7 libxcb-dri2-0 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-shape0 libxcb-sync1 libxcb1-dev
  libxcomposite1 libxdamage1 libxdmcp-dev libxfixes3 libxft2 libxi6 libxinerama1 libxmu6 libxpm4 libxrandr2
  libxrender1 libxshmfence1 libxt-dev libxt6 libxtst6 libxv1 libxxf86dga1 libxxf86vm1 openjdk-11-jdk-headless
  openjdk-11-jre openjdk-11-jre-headless x11-common x11-utils x11proto-core-dev x11proto-dev xorg-sgml-doctools
```

Get the latest version of Halyard:

curl -O
https://raw.githubusercontent.com/spinnaker/halyard/master/ins

tall/debian/InstallHalyard.sh

```
[redacted]@instance-1:~$ curl -O https://raw.githubusercontent.com/spinnaker/halyard/master/install/debian/InstallHalyard.sh
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  9188  100  9188    0     0  47360      0 --:--:-- --:--:-- --:--:-- 47606
```

Install Halyard

sudo bash InstallHalyard.sh

```
[redacted]@instance-1:~$ sudo bash InstallHalyard.sh
Please supply a non-root user to run Halyard as: [redacted]
Halyard version will be stable
Halyard will be downloaded from gs://spinnaker-artifacts/halyard
Halyard config will come from bucket gs://[redacted]onfig
Halconfig will be stored at /home/[redacted].hal/config
Uninstall script is located at /home/[redacted].hal/uninstall.sh
~/installhalyard.uTak ~
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  319M  100  319M    0     0   148M      0  0:00:02  0:00:02 --:--:--  148M
halyard/
halyard/bin/
halyard/bin/halyard.bat
halyard/bin/halyard
halyard/bin/hal.bat
halyard/bin/hal
halyard/lib/
halyard/lib/azure-keyvault-1.0.0.jar
halyard/lib/groovy-test-junit5-2.5.11.jar
halyard/lib/aws-java-sdk-waf-1.11.877.jar
halyard/lib/maven-resolver-spi-1.1.1.jar
halyard/lib/kotlin-stdlib-jdk7-1.4.10.jar
halyard/lib/spring-boot-gradle-plugin-1.4.7.RELEASE.jar
halyard/lib/google-api-services-cloudkms-v1-rev8-1.22.0.jar
halyard/lib/commons-compress-1.20.jar
halyard/lib/aws-java-sdk-cognitosync-1.11.877.jar
halyard/lib/aws-java-sdk-sso-1.11.877.jar
halyard/lib/spring-boot-starter-security-2.2.5.RELEASE.jar
halyard/lib/azure-mgmt-redis-1.19.0.jar
[redacted]
halyard/lib/aws-java-sdk-appconfig-1.11.877.jar
halyard/config/
halyard/config/halyard.yml
hal
update-halyard
~
The halyard daemon isn't running yet... starting it manually...
1.40.0-20201028133206

Would you like to configure halyard to use bash auto-completion? [default=Y]: Y
```

Check whether Halyard was installed properly:

hal -v

```
[redacted]@instance-1:~$ hal -v
1.40.0-20201028133206
```

2. Choose Cloud Provider

We will choose Google Compute Engine:;

- Auth gcloud
- SA account
- Roles/Permission on SA account

You need a Google Cloud Platform (GCP) project to run Spinnaker against. The next steps assume you've already created a project, and installed gcloud. You can check that gcloud is installed and authenticated by running:

gcloud info

```
Google Cloud SDK [324.0.0]

Platform: [Linux, x86_64] uname_result(system='Linux', node='instance-1', release='5.4.0-1034-gcp', version='#37~18.04.1-Ubunt
64', processor='x86_64')
Locale: ('en_US', 'UTF-8')
Python Version: [3.5.2 (default, Oct  7 2020, 17:19:02)  [GCC 5.4.0 20160609]]
Python Location: [/snap/google-cloud-sdk/165/usr/bin/python3]
Site Packages: [Disabled]

Installation Root: [/snap/google-cloud-sdk/165]
Installed Components:
  bq: [2.0.64]
  gsutil: [4.57]
  core: [2021.01.19]
  alpha: [2021.01.19]
  beta: [2021.01.19]
System PATH: [/snap/google-cloud-sdk/165/usr/bin/:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr
Python PATH: [/snap/google-cloud-sdk/165/lib/third_party:/snap/google-cloud-sdk/165/lib:/snap/google-cloud-sdk/165/usr/lib/pyt
on3.5/:/snap/google-cloud-sdk/165/usr/lib/python3.5/plat-x86_64-linux-gnu:/snap/google-cloud-sdk/165/usr/lib/python3.5/lib-dyn
Cloud SDK on PATH: [False]
Kubectl on PATH: [False]

WARNING: There are other instances of the Google Cloud Platform tools on your system PATH.
  /usr/bin/snap

Installation Properties: [/snap/google-cloud-sdk/165/properties]
```

Downloading credentials

Spinnaker needs a service account to authenticate as against GCE, with the role enumerated below enabled. If you don't already have such a service account with the corresponding JSON key downloaded, you can run the following commands to do so

SERVICE_ACCOUNT_NAME=spinnaker-gce-account
SERVICE_ACCOUNT_DEST=~/.gcp/gce-account.json

```
[redacted]@instance-1:~$ SERVICE_ACCOUNT_NAME=spinnaker-gce-account
```

```
[redacted]@instance-1:~$ SERVICE_ACCOUNT_DEST=~/.gcp/gce-account.json
```

gcloud iam service-accounts create $SERVICE_ACCOUNT_NAME --
display-name $SERVICE_ACCOUNT_NAME

```
[redacted]@instance-1:~$ gcloud iam service-accounts create $SERVICE_ACCOUNT_NAME --display-name $SERVICE_ACCOUNT_NAME
Created service account [spinnaker-gce-account].
```

SA_EMAIL=$(gcloud iam service-accounts list --filter="displayName:
$SERVICE_ACCOUNT_NAME" --format='value(email)')

```
[redacted]@instance-1:~$ SA_EMAIL=$(gcloud iam service-accounts list --filter="displayName:$SERVICE_ACCOUNT_NAME" --format='value(email)')
```

PROJECT=$(gcloud config get-value project)

```
[redacted]@instance-1:~$ PROJECT=$(gcloud config get-value project)
```

gcloud projects add-iam-policy-binding $PROJECT --member serviceAccount:
$SA_EMAIL --role roles/compute.instanceAdmin

This will give error as you have not authenticate your GCP from this machine

```
[redacted]@instance-1:~$ gcloud projects add-iam-policy-binding $PROJECT --member serviceAccount:$SA_EMAIL --role roles/compute.instanceAdmin
ERROR: (gcloud.projects.add-iam-policy-binding) User [977854681766-compute@developer.gserviceaccount.com] does not have permission to access projects instance [careful-trai
-302617:setIamPolicy] (or it may not exist): Policy update access denied.
```

```
[redacted]@instance-1:~$ gcloud auth login

You are running on a Google Compute Engine virtual machine.
It is recommended that you use service accounts for authentication.

You can run:

  $ gcloud config set account `ACCOUNT`

to switch accounts if necessary.

Your credentials may be visible to others with access to this
virtual machine. Are you sure you want to authenticate with
your personal account?

Do you want to continue (Y/n)?  Y

Go to the following link in your browser:

    https://accounts.google.com/o/oauth2/auth?response_type=code&client_id=32555940559.apps.googleusercontent.com&redirect_uri=urn%3Aiet
+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fuserinfo.email+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fcloud-platform+https%3A%2F%2Fwww.goo
tps%3A%2F%2Fwww.googleapis.com%2Fauth%2Fcompute+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Faccounts.reauth&state=6OIuj3gkRDkaBgmC65q1s128
t=consent&access_type=offline&code_challenge=sdaBhQ0R5A3Wq_WZvL2YM57XJsJucjX5FOvoCm54G0M

Enter verification code: 4/1AY0e-g5yIMedIemqL0_7ZEUFNHGRzLrCtqnZnl43_hnbkBlHoHmSZNYZHpE

You are now logged in as [[redacted]].
Your current project is [careful-trainer-302617].  You can change this setting by running:
  $ gcloud config set project PROJECT_ID
```

```
[redacted]@instance-1:~$ gcloud projects add-iam-policy-binding $PROJECT --member serviceAccount:$SA_EMAIL --role roles/compute.instanceAdmin
Updated IAM policy for project [careful-trainer-302617].
bindings:
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.instanceAdmin
- members:
  - serviceAccount:service-977854681766@compute-system.iam.gserviceaccount.com
  role: roles/compute.serviceAgent
- members:
  - serviceAccount:service-977854681766@container-engine-robot.iam.gserviceaccount.com
  role: roles/container.serviceAgent
- members:
  - serviceAccount:service-977854681766@containerregistry.iam.gserviceaccount.com
  role: roles/containerregistry.ServiceAgent
- members:
  - serviceAccount:977854681766-compute@developer.gserviceaccount.com
  - serviceAccount:977854681766@cloudservices.gserviceaccount.com
  role: roles/editor
- members:
  - user:[redacted]
  role: roles/owner
etag: BwW5ypYFmEg=
version: 1
```

- **Assign roles to the SA**

gcloud projects add-iam-policy-binding $PROJECT --member serviceAccount:
$SA_EMAIL --role roles/compute.networkAdmin

gcloud projects add-iam-policy-binding $PROJECT --member serviceAccount:
$SA_EMAIL --role roles/compute.securityAdmin

gcloud projects add-iam-policy-binding $PROJECT --member serviceAccount:
$SA_EMAIL --role roles/compute.storageAdmin

gcloud projects add-iam-policy-binding $PROJECT --member serviceAccount:
$SA_EMAIL --role roles/iam.serviceAccountActor

```
[redacted]@instance-1:~$ gcloud projects add-iam-policy-binding $PROJECT --member serviceAccount:$SA_EMAIL --role roles/compute.networkAdmin
Updated IAM policy for project [careful-trainer-302617].
bindings:
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.instanceAdmin
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.networkAdmin
- members:
  - serviceAccount:service-977854681766@compute-system.iam.gserviceaccount.com
  role: roles/compute.serviceAgent
- members:
  - serviceAccount:service-977854681766@container-engine-robot.iam.gserviceaccount.com
  role: roles/container.serviceAgent
```

```
[redacted]@instance-1:~$ gcloud projects add-iam-policy-binding $PROJECT --member serviceAccount:$SA_EMAIL --role roles/compute.securityAdmin
Updated IAM policy for project [careful-trainer-302617].
bindings:
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.instanceAdmin
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.networkAdmin
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.securityAdmin
- members:
  - serviceAccount:service-977854681766@compute-system.iam.gserviceaccount.com
  role: roles/compute.serviceAgent
```

```
[redacted]@instance-1:~$ gcloud projects add-iam-policy-binding $PROJECT --member serviceAccount:$SA_EMAIL --role roles/compute.storageAdmin
Updated IAM policy for project [careful-trainer-302617].
bindings:
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.instanceAdmin
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.networkAdmin
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.securityAdmin
- members:
  - serviceAccount:service-977854681766@compute-system.iam.gserviceaccount.com
  role: roles/compute.serviceAgent
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.storageAdmin
- members:
  - serviceAccount:service-977854681766@container-engine-robot.iam.gserviceaccount.com
  role: roles/container.serviceAgent
```

```
[redacted]@instance-1:~$ gcloud projects add-iam-policy-binding $PROJECT --member serviceAccount:$SA_EMAIL --role roles/iam.serviceAccountActor
Updated IAM policy for project [careful-trainer-302617].
bindings:
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.instanceAdmin
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.networkAdmin
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.securityAdmin
- members:
  - serviceAccount:service-977854681766@compute-system.iam.gserviceaccount.com
  role: roles/compute.serviceAgent
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.storageAdmin
- members:
  - serviceAccount:service-977854681766@container-engine-robot.iam.gserviceaccount.com
  role: roles/container.serviceAgent
- members:
  - serviceAccount:service-977854681766@containerregistry.iam.gserviceaccount.com
```

- **Generate json key file and store into a directory:**
  mkdir -p $(dirname $SERVICE_ACCOUNT_DEST)

```
[redacted]@instance-1:~$ mkdir -p $(dirname $SERVICE_ACCOUNT_DEST)
```

gcloud iam service-accounts keys create $SERVICE_ACCOUNT_DEST --iam-account $SA_EMAIL

```
[redacted]@instance-1:~$ gcloud iam service-accounts keys create $SERVICE_ACCOUNT_DEST --iam-account $SA_EMAIL
created key [ae5e42388f00d11860383dcab77add2d3d9f883c] of type [json] as [/home/vineetmittal_83/.gcp/gce-account.json] for [spinnaker-gce-account@careful-trainer-302617.iam.gs
erviceaccount.com]
```

- **Provider is enable**

hal config provider google enable

```
[redacted]@instance-1:~$ hal config provider google enable
+ Get current deployment
  Success
+ Edit the google provider
  Success
Validation in default.provider.google:
- WARNING Provider google is enabled, but no accounts have been
  configured.

Validation in default:
- WARNING You have not yet selected a version of Spinnaker to
  deploy.
? Options include:
  - 1.20.7
  - 1.19.14
  - 1.21.5
  - 1.22.4
  - 1.23.5
  - 1.24.2

+ Successfully enabled google
```

PROJECT=$(gcloud config get-value project)

```
[redacted]@instance-1:~$ PROJECT=$(gcloud config get-value project)
```

ACCOUNT=my-gce-account

```
[redacted]@instance-1:~$ ACCOUNT=my-gce-account
```

hal config provider google account add $ACCOUNT --project $PROJECT --
json-path $SERVICE_ACCOUNT_DEST

```
[redacted]@instance-1:~$ hal config provider google account add $ACCOUNT --project $PROJECT --json-path $SERVICE_ACCOUNT_DEST
+ Get current deployment
  Success
+ Add the my-gce-account account
  Success
Validation in default:
- WARNING You have not yet selected a version of Spinnaker to
  deploy.
? Options include:
  - 1.20.7
  - 1.19.14
  - 1.21.5
  - 1.22.4
  - 1.23.5
  - 1.24.2

+ Successfully added account my-gce-account for provider
  google.
```

3. Choose an environment

hal config deploy edit --type distributed --account-name $ACCOUNT

```
[redacted]@instance-1:~$ hal config deploy edit --type distributed --account-name $ACCOUNT
+ Get current deployment
  Success
+ Get the deployment environment
  Success
+ Edit the deployment environment
  Success
Validation in default:
- WARNING You have not yet selected a version of Spinnaker to
  deploy.
? Options include:
  - 1.20.7
  - 1.19.14
  - 1.21.5
  - 1.22.4
  - 1.23.5
  - 1.24.2

Validation in default.deploymentEnvironment:
- WARNING Support for distributed deployments on GCE aren't fully
  supported yet.

+ Successfully updated your deployment environment.
```

We also need to enable Kubernetes provider

hal config provider kubernetes enable

```
[redacted]@instance-1:~$ hal config provider kubernetes enable
+ Get current deployment
  Success
+ Edit the kubernetes provider
  Success
Validation in default.provider.kubernetes:
- WARNING Provider kubernetes is enabled, but no accounts have been
  configured.

+ Successfully enabled kubernetes
```

Install Kubectl on halyard machine

curl -s https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo apt-key add -

```
[redacted]instance-1:~$ curl -s https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo apt-key add -
```

echo "deb https://apt.kubernetes.io/ kubernetes-xenial main" | sudo tee -a /etc/apt/sources.list.d/kubernetes.list

```
[redacted]@instance-1:~$ echo "deb https://apt.kubernetes.io/ kubernetes-xenial main" | sudo tee -a /etc/apt/sources.list.d/kubernetes.list
deb https://apt.kubernetes.io/ kubernetes-xenial main
```

sudo apt-get update

```
Hit:1 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:4 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Hit:6 http://archive.canonical.com/ubuntu bionic InRelease
Get:7 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-updates/main amd64 Packages [1853 kB]
Get:8 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-updates/universe amd64 Packages [1709 k
Get:9 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-updates/multiverse amd64 Packages [31.8
Get:10 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-updates/multiverse Translation-en [730
Get:5 https://packages.cloud.google.com/apt kubernetes-xenial InRelease [9383 B]
Get:11 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 Packages [44.1 kB]
Fetched 3906 kB in 1s (3775 kB/s)
Reading package lists... Done
```

sudo apt-get install -y kubectl

```
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libnuma1
Use 'sudo apt autoremove' to remove it.
The following NEW packages will be installed:
  kubectl
0 upgraded, 1 newly installed, 0 to remove and 2 not upgraded.
Need to get 7940 kB of archives.
After this operation, 40.2 MB of additional disk space will be used.
Get:1 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 kubectl amd64 1.20.2-00 [7940 kB]
Fetched 7940 kB in 0s (17.2 MB/s)
N: Ignoring file 'kubernete' in directory '/etc/apt/sources.list.d/' as it has no filename extension
Selecting previously unselected package kubectl.
(Reading database ... 68372 files and directories currently installed.)
Preparing to unpack .../kubectl_1.20.2-00_amd64.deb ...
Unpacking kubectl (1.20.2-00) ...
Setting up kubectl (1.20.2-00) ...
```

Verify if you are able to get cluster info or node info. You are not because till now we don't have kube config file in this machine

kubectl get nodes

```
@instance-1:~$ kubectl get nodes
The connection to the server localhost:8080 was refused - did you specify the right host or port?
```

Retrieve kubconfig or credential inform from GKE cluster

gcloud container clusters get-credentials cluster-1 --zone us-central1-c

Verify if config file comes under .kube directory

ls -ltrh .kube/

Now run kubectl command. Now you should get information from cluster.

kubectl get nodes

```
@instance-1:~$ kubectl get nodes
NAME                                       STATUS   ROLES    AGE   VERSION
gke-cluster-1-default-pool-99263474-f9t6   Ready    <none>   9h    v1.16.15-gke.6000
gke-cluster-1-default-pool-99263474-z7tm   Ready    <none>   9h    v1.16.15-gke.6000
gke-cluster-1-default-pool-99263474-zt98   Ready    <none>   9h    v1.16.15-gke.6000
```

CONTEXT=$(kubectl config current-context)

```
instance-1:~$ CONTEXT=$(kubectl config current-context)
```

hal config provider kubernetes account add my-k8s-account --context $CONTEXT

```
@instance-1:~$ hal config provider kubernetes account add my-k8s-account --context $CONTEXT
+ Get current deployment
  Success
+ Add the my-k8s-account account
  Success
+ Successfully added account my-k8s-account for provider
  kubernetes.
```

hal config deploy edit --account-name my-k8s-account --type distributed

```
@instance-1:~$ hal config deploy edit --account-name my-k8s-account --type distributed
+ Get current deployment
  Success
+ Get the deployment environment
  Success
+ Edit the deployment environment
  Success
+ Successfully updated your deployment environment.
```

4. Choose Storage

We will use google cloud storage

Spinnaker needs a service account to authenticate as against GCP, with the roles/storage.admin role enabled

SERVICE_ACCOUNT_NAME=spinnaker-gcs-account
SERVICE_ACCOUNT_DEST=~/.gcp/gcs-account.json

```
@instance-1:~$ SERVICE_ACCOUNT_NAME=spinnaker-gcs-account
@instance-1:~$
@instance-1:~$
@instance-1:~$ SERVICE_ACCOUNT_DEST=~/.gcp/gcs-account.json
@instance-1:~$
```

gcloud iam service-accounts create $SERVICE_ACCOUNT_NAME --display-name $SERVICE_ACCOUNT_NAME

```
@instance-1:~$ gcloud iam service-accounts create $SERVICE_ACCOUNT_NAME --display-name $SERVICE_ACCOUNT_NAME
Created service account [spinnaker-gcs-account].
```

SA_EMAIL=$(gcloud iam service-accounts list --filter="displayName:$SERVICE_ACCOUNT_NAME" --format='value(email)')

```
@instance-1:~$ SA_EMAIL=$(gcloud iam service-accounts list --filter="displayName:$SERVICE_ACCOUNT_NAME" --format='value(email)')
```

PROJECT=$(gcloud config get-value project)

```
instance-1:~$ PROJECT=$(gcloud config get-value project)
```

gcloud projects add-iam-policy-binding $PROJECT --role roles/storage.admin --member serviceAccount:$SA_EMAIL

```
[redacted]@instance-1:~$ gcloud projects add-iam-policy-binding $PROJECT --role roles/storage.admin --member serviceAccount:$SA_EMAIL
Updated IAM policy for project [careful-trainer-302617].
bindings:
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.instanceAdmin
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.networkAdmin
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.securityAdmin
- members:
  - serviceAccount:service-977854681766@compute-system.iam.gserviceaccount.com
  role: roles/compute.serviceAgent
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/compute.storageAdmin
- members:
  - serviceAccount:service-977854681766@container-engine-robot.iam.gserviceaccount.com
  role: roles/container.serviceAgent
- members:
  - serviceAccount:service-977854681766@containerregistry.iam.gserviceaccount.com
  role: roles/containerregistry.ServiceAgent
- members:
  - serviceAccount:977854681766-compute@developer.gserviceaccount.com
  - serviceAccount:977854681766@cloudservices.gserviceaccount.com
  role: roles/editor
- members:
  - serviceAccount:spinnaker-gce-account@careful-trainer-302617.iam.gserviceaccount.com
  role: roles/iam.serviceAccountActor
- members:
  - user:vineetmittal.83@gmail.com
  role: roles/owner
- members:
```

mkdir -p $(dirname $SERVICE_ACCOUNT_DEST)

```
[redacted]@instance-1:~$ mkdir -p $(dirname $SERVICE_ACCOUNT_DEST)
```

gcloud iam service-accounts keys create $SERVICE_ACCOUNT_DEST --iam-account $SA_EMAIL

```
[redacted]@instance-1:~$ gcloud iam service-accounts keys create $SERVICE_ACCOUNT_DEST --iam-account $SA_EMAIL
created key [e24ac18f6a57fb8645956cdfd48734a966256129] of type [json] as [/home/[redacted]/.gcp/gcs-account.json] for [spinnaker-gcs-account@careful-trainer-302617.iam.gserviceaccount.com]
```

Edit storage setting

Halyard will create a bucket for you if the bucket you specify doesn't exist yet,
or if you don't specify one at all. All that's required are the following values

PROJECT=$(gcloud config get-value project)

BUCKET_LOCATION=us

```
[redacted]@instance-1:~$ PROJECT=$(gcloud config get-value project)
[redacted]@instance-1:~$ BUCKET_LOCATION=us
```

hal config storage gcs edit --project $PROJECT --bucket-location $BUCKET_LOCATION --json-path $SERVICE_ACCOUNT_DEST

```
[redacted]@instance-1:~$ hal config storage gcs edit --project $PROJECT --bucket-location $BUCKET_LOCATION --json-path $SERVICE_ACCOUNT_DEST
+ Get current deployment
  Success
+ Get persistent store
  Success
Generated bucket name: spin-d61a9a63-09be-4811-b2a4-7d908847959c
+ Edit persistent store
  Success
Validation in default.persistentStorage:
- WARNING Your deployment will most likely fail until you configure
  and enable a persistent store.

Validation in default:
- WARNING You have not yet selected a version of Spinnaker to
  deploy.
? Options include:
  - 1.20.7
  - 1.19.14
  - 1.21.5
  - 1.22.4
  - 1.23.5
  - 1.24.2

+ Successfully edited persistent store "gcs".
```

Finally, set the storage source to GCS

hal config storage edit --type gcs

```
[redacted]@instance-1:~$ hal config storage edit --type gcs
+ Get current deployment
  Success
+ Get persistent storage settings
  Success
+ Edit persistent storage settings
  Success
Validation in default:
- WARNING You have not yet selected a version of Spinnaker to
  deploy.
? Options include:
  - 1.20.7
  - 1.19.14
  - 1.21.5
  - 1.22.4
  - 1.23.5
  - 1.24.2

+ Successfully edited persistent storage.
```

5. Deploy Spinnaker

List available version

hal version list

```
[redacted]@instance-1:~$ hal version list
+ Get current deployment
  Success
+ Get Spinnaker version
  Success
+ Get released versions
  Success
+ You are on version "", and the following are available:
 - 1.19.14 (Gilmore Girls A Year in the Life):
   Changelog: https://gist.github.com/spinnaker-release/cc4410d674679c5765246a40f28e3cad
   Published: Thu Aug 13 23:44:46 UTC 2020
   (Requires Halyard >= 1.32)
 - 1.20.7 (Drive to Survive):
   Changelog: https://gist.github.com/spinnaker-release/75d50c7b931f1089e710a0e9d1acf8c4
   Published: Wed Jul 22 22:22:44 UTC 2020
   (Requires Halyard >= 1.32)
 - 1.21.5 (Dark):
   Changelog: https://gist.github.com/spinnaker-release/98c3bab183b507662a8f5524e54626d4
   Published: Mon Dec 07 23:09:05 UTC 2020
   (Requires Halyard >= 1.32)
 - 1.22.4 (Anne):
   Changelog: https://gist.github.com/spinnaker-release/e457272b5aac37a5c6512b80b0c53d5f
   Published: Tue Dec 08 14:56:16 UTC 2020
   (Requires Halyard >= 1.32)
```

Set version that you want use

hal config version edit --version 1.19.14

```
[redacted]@instance-1:~$ hal config version edit --version 1.19.14
+ Get current deployment
  Success
+ Edit Spinnaker version
  Success
+ Spinnaker has been configured to update/install version
  "1.19.14". Deploy this version of Spinnaker with `hal deploy apply`.
```

- **Deploy Spinnaker**

```
[redacted]@instance-1:~$ hal deploy apply
+ Get current deployment
  Success
+ Prep deployment
  Success
Validation in default.stats:
- INFO Stats are currently ENABLED. Usage statistics are being
  collected. Thank you! These stats inform improvements to the product, and that
  helps the community. To disable, run `hal config stats disable`. To learn more
  about what and how stats data is used, please see
  https://www.spinnaker.io/community/stats.

Validation in default.security:
- WARNING Your UI or API domain does not have override base URLs
  set even though your Spinnaker deployment is a Distributed deployment on a
  remote cloud provider. As a result, you will need to open SSH tunnels against
  that deployment to access Spinnaker.
? We recommend that you instead configure an authentication
  mechanism (OAuth2, SAML2, or x509) to make it easier to access Spinnaker
  securely, and then register the intended Domain and IP addresses that your
  publicly facing services will be using.

+ Preparation complete... deploying Spinnaker
+ Get current deployment
  Success
+ Apply deployment
  Success
+ Deploy spin-redis
  Success
+ Deploy spin-clouddriver
  Success
+ Deploy spin-front50
  Success
+ Deploy spin-orca
  Success
+ Deploy spin-deck
  Success
+ Deploy spin-echo
  Success
+ Deploy spin-gate
```

Verify pods of all microservices are running

kubectl get pods -n spinnaker

```
[redacted]@instance-1:~$ kubectl get pods -n spinnaker
NAME                                 READY   STATUS    RESTARTS   AGE
spin-clouddriver-77b5d498cb-cvkqm    1/1     Running   0          5m46s
spin-deck-6d8465bb9b-gldss           1/1     Running   0          5m47s
spin-echo-d4d8f46b5-tkhqn            1/1     Running   0          5m47s
spin-front50-854848ddbf-dpq2b        1/1     Running   0          5m46s
spin-gate-59785dfb86-lz86h           1/1     Running   0          5m48s
spin-orca-f956f95b7-ddnnv            1/1     Running   0          5m47s
spin-redis-6c67f64b65-pbpxm          1/1     Running   0          5m48s
spin-rosco-7bb8d7fdf-446s5           1/1     Running   0          5m45s
```

Verify services in spinnaker namespace

kubectl get svc -n spinnaker

```
[redacted]@instance-1:~$ kubectl get svc -n spinnaker
NAME              TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)    AGE
spin-clouddriver  ClusterIP   10.8.11.92     <none>        7002/TCP   10m
spin-deck         ClusterIP   10.8.13.13     <none>        9000/TCP   10m
spin-echo         ClusterIP   10.8.1.173     <none>        8089/TCP   10m
spin-front50      ClusterIP   10.8.2.168     <none>        8080/TCP   10m
spin-gate         ClusterIP   10.8.11.175    <none>        8084/TCP   10m
spin-orca         ClusterIP   10.8.13.179    <none>        8083/TCP   10m
spin-redis        ClusterIP   10.8.13.61     <none>        6379/TCP   10m
spin-rosco        ClusterIP   10.8.8.14      <none>        8087/TCP   10m
```

6. Connect UI

Now we need to change service type of spin-deck(web-UI) and spin-gate (API Gateway) to Loadbalancer

kubectl edit svc spin-deck -n spinnaker

```
[redacted]@instance-1:~$ kubectl edit svc spin-deck -n spinnaker
service/spin-deck edited
```

```
# Please edit the object below. Lines beginning with a '#' will be ignored,
# and an empty file will abort the edit. If an error occurs while saving this file will be
# reopened with the relevant failures.
#
apiVersion: v1
kind: Service
metadata:
  annotations:
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion":"v1","kind":"Service","metadata":{"annotations":{},"labels":{"app":"spin","cluster":"spin-deck"}
":[{"port":9000,"protocol":"TCP","targetPort":9000}],"selector":{"app":"spin","cluster":"spin-deck","type":"Cluste
  creationTimestamp: "2021-01-26T17:42:48Z"
  labels:
    app: spin
    cluster: spin-deck
  name: spin-deck
  namespace: spinnaker
  resourceVersion: "148068"
  selfLink: /api/v1/namespaces/spinnaker/services/spin-deck
  uid: dcbf56b5-00d8-4eb9-8132-d2026749ee52
spec:
  clusterIP: 10.8.13.13
  ports:
  - port: 9000
    protocol: TCP
    targetPort: 9000
  selector:
    app: spin
    cluster: spin-deck
  sessionAffinity: None
  type: LoadBalancer
status:
  loadBalancer: {}
```

kubectl edit svc spin-gate -n spinnaker

```
[redacted]@instance-1:~$ kubectl edit svc spin-gate -n spinnaker
service/spin-gate edited
```

```
# Please edit the object below. Lines beginning with a '#' will be ignored,
# and an empty file will abort the edit. If an error occurs while saving this file will be
# reopened with the relevant failures.
#
apiVersion: v1
kind: Service
metadata:
  annotations:
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion":"v1","kind":"Service","metadata":{"annotations":{},"labels":{"app":"spin","cluster":"spin-gate
":[{"port":8084,"protocol":"TCP","targetPort":8084}],"selector":{"app":"spin","cluster":"spin-gate"},"type":"Clust
  creationTimestamp: "2021-01-26T17:42:49Z"
  labels:
    app: spin
    cluster: spin-gate
  name: spin-gate
  namespace: spinnaker
  resourceVersion: "148093"
  selfLink: /api/v1/namespaces/spinnaker/services/spin-gate
  uid: 9276ac3e-ef19-4a75-b64a-fde2664bf0f7
spec:
  clusterIP: 10.8.11.175
  ports:
  - port: 8084
    protocol: TCP
    targetPort: 8084
  selector:
    app: spin
    cluster: spin-gate
  sessionAffinity: None
  type: LoadBalancer
status:
  loadBalancer: {}
~
~
```

Verify services again. Service type should be shown as Loadbalancer for spin -deck and spin-gate services

hal config security ui edit --override-base-url "http://35.202.139.231:9000"

```
[redacted]@instance-1:~$ hal config security ui edit --override-base-url "http://35.202.139.231:9000"
+ Get current deployment
  Success
+ Get UI security settings
  Success
+ Edit UI security settings
  Success
Validation in default.security:
- WARNING Your UI or API domain does not have override base URLs
  set even though your Spinnaker deployment is a Distributed deployment on a
  remote cloud provider. As a result, you will need to open SSH tunnels against
  that deployment to access Spinnaker.
? We recommend that you instead configure an authentication
  mechanism (OAuth2, SAML2, or x509) to make it easier to access Spinnaker
  securely, and then register the intended Domain and IP addresses that your
  publicly facing services will be using.

+ Successfully updated UI security settings.
```

hal config security api edit --override-base-url "http://35.188.29.83:8084"

```
[redacted]@instance-1:~$ hal config security api edit --override-base-url "http://35.188.29.83:8084"
+ Get current deployment
  Success
+ Get API security settings
  Success
+ Edit API security settings
  Success
```

Redeploy Spinnaker

```
[redacted]@instance-1:~$ hal deploy apply
+ Get current deployment
  Success
+ Prep deployment
  Success
Validation in default.stats:
- INFO Stats are currently ENABLED. Usage statistics are being
  collected. Thank you! These stats inform improvements to the product, and that
  helps the community. To disable, run `hal config stats disable`. To learn more
  about what and how stats data is used, please see
  https://www.spinnaker.io/community/stats.

+ Preparation complete... deploying Spinnaker
+ Get current deployment
  Success
+ Apply deployment
  Success
+ Deploy spin-redis
  Success
+ Deploy spin-clouddriver
  Success
+ Deploy spin-front50
  Success
+ Deploy spin-orca
  Success
+ Deploy spin-deck
```

Access Web UI with URL

http://35.202.139.231:9000/