Setup a multi-node Arktos cluster using Ubuntu 18.04 or custom image on GCP

Date: 29-12-2021

Prerequisites:

User will need to run the following steps on the workstation machine (the recommended instance size should be at least `16 vCPUs and 64GB RAM` and the storage size should be `150GB` or more).

User will need a GCP account, and gcloud configured in your bash profile.

Installation steps:

1. Install gcloud

Command:

```
echo "deb [signed-by=/usr/share/keyrings/cloud.google.gpg]
https://packages.cloud.google.com/apt cloud-sdk main" | sudo tee -a
/etc/apt/sources.list.d/google-cloud-sdk.list
```

Output:

```
root@prajwal-gcloud:~# echo "deb [signed-by=/usr/share/keyrings/cloud.google.gpg] https://packages.cloud.google.com/apt cloud-sdk main" | sudo tee -a /etc/apt/sources
.list.d/google-cloud-sdk.list
deb [signed-by=/usr/share/keyrings/cloud.google.gpg] https://packages.cloud.google.com/apt cloud-sdk main
root@prajwal-gcloud:~#
```

Command:

```
sudo apt-get install apt-transport-https ca-certificates gnupg -y -q
```

Output:

```
root@prajwal-gcloud:~# sudo apt-get install apt-transport-https ca-certificates gnupg -y -q
Reading package lists...
Building dependency tree...
Reading state information...
apt is already the newest version (1.6.14).
apt set to manually installed.
ca-certificates is already the newest version (20210119~18.04.2).
ca-certificates set to manually installed.
gnupg is already the newest version (2.2.4-1ubuntu1.4).
gnupg set to manually installed.
The following package was automatically installed and is no longer required:
  libnuma1
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

Command:

```
curl https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo apt-key --keyring
/usr/share/keyrings/cloud.google.gpg add -
```

Output:

```
root@prajwal-gcloud:~# curl https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo apt-key --keyring /usr
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  2537  100  2537    0     0   154k      0 --:--:-- --:--:-- --:--:--  154k
OK
```

Command:

```
sudo apt-get update -y && sudo apt-get install make google-cloud-sdk -y
```

Output:

```
root@prajwal-gcloud:~# sudo apt-get update -y && sudo apt-get install make google-cloud-sdk -y
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 https://packages.cloud.google.com/apt cloud-sdk InRelease [6739 B]
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]
```

Command:

```
gcloud init
```

Output:

```
root@prajwal-gcloud:~# gcloud init
Welcome! This command will take you through the configuration of gcloud.

Settings from your current configuration [default] are:
core:
  account: 538803277248-compute@developer.gserviceaccount.com
  disable_usage_reporting: 'True'
  project: '1234'

Pick configuration to use:
 [1] Re-initialize this configuration [default] with new settings
 [2] Create a new configuration
Please enter your numeric choice:  2

Enter configuration name. Names start with a lower case letter and contain only lower case letters a-z, digits 0-9, and hyphens '-':  click2cloud01
Your current configuration has been set to: [click2cloud01]

You can skip diagnostics next time by using the following flag:
  gcloud init --skip-diagnostics

Network diagnostic detects and fixes local network connection issues.
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] 538803277248-compute@developer.gserviceaccount.com
 [2] Log in with a new account
Please enter your numeric choice:  2
```

```
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_u
pe=openid+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fuserinfo.email+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fcloud-platform+
appengine.admin+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fcompute+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Faccounts.reauth&
t=consent&access_type=offline&code_challenge=08IN3chbzLGuioLE7fx1UDO5wfOs4QE_SFg-JE3-E4g&code_challenge_method=S256

Enter verification code: 4/1AX4XfWgLvG5uHn_igQHMOlF6LMpxt_HBs6fPMn0XZ5-OsxRnCUTsV0DMlXY
You are logged in as: [c2cgce@gmail.com].

Pick cloud project to use:
 [1] click2cloud
 [2] eternal-argon-327706
 [3] festive-ray-320412
 [4] Create a new project
Please enter numeric choice or text value (must exactly match list item):  1

Your current project has been set to: [click2cloud].

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

Your Google Cloud SDK is configured and ready to use!

* Commands that require authentication will use c2cgce@gmail.com by default
* Commands will reference project `click2cloud` by default
Run `gcloud help config` to learn how to change individual settings

This gcloud configuration is called [click2cloud01]. You can create additional configurations if you work with multiple acco
Run `gcloud topic configurations` to learn more.
```

2. User will need docker and golang to create binaries and docker images

Install Docker

Command:

curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o /usr/share/keyrings/docker-archive-keyring.gpg

echo \
  "deb [arch=amd64 signed-by=/usr/share/keyrings/docker-archive-keyring.gpg] https://download.docker.com/linux/ubuntu \
  $(lsb_release -cs) stable" | sudo tee /etc/apt/sources.list.d/docker.list > /dev/null

sudo apt-get update -y

sudo apt-get install docker-ce docker-ce-cli containerd.io -y

Output:

Command:

```
root@prajwal-gcloud:~# curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o /usr/share/keyrings/docker-archive-keyring.gpg
root@prajwal-gcloud:~# echo \
>    "deb [arch=amd64 signed-by=/usr/share/keyrings/docker-archive-keyring.gpg] https://download.docker.com/linux/ubuntu \
>    $(lsb_release -cs) stable" | sudo tee /etc/apt/sources.list.d/docker.list > /dev/null
root@prajwal-gcloud:~# sudo apt-get update -y
Hit:1 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:3 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-backports InRelease
Get:4 https://download.docker.com/linux/ubuntu bionic InRelease [64.4 kB]
Hit:5 http://security.ubuntu.com/ubuntu bionic-security InRelease
Get:6 https://packages.cloud.google.com/apt cloud-sdk InRelease [6739 B]
Get:7 https://download.docker.com/linux/ubuntu bionic/stable amd64 Packages [22.5 kB]
Fetched 93.7 kB in 0s (259 kB/s)
Reading package lists... Done
W: Target Packages (main/binary-amd64/Packages) is configured multiple times in /etc/apt/sources.list.d/google-cloud-sdk.list:1 and /etc/apt/sources.list.d/
ud-sdk.list:2
W: Target Packages (main/binary-all/Packages) is configured multiple times in /etc/apt/sources.list.d/google-cloud-sdk.list:1 and /etc/apt/sources.list.d/g
```

`sudo apt-get update -y`

Output:

```
root@prajwal-gcloud:~# sudo apt-get update -y
Hit:1 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:3 http://us-central1.gce.archive.ubuntu.com/ubuntu bionic-backports InRelease
Hit:4 https://packages.cloud.google.com/apt cloud-sdk InRelease
Hit:5 http://security.ubuntu.com/ubuntu bionic-security InRelease
Hit:6 https://download.docker.com/linux/ubuntu bionic InRelease
Reading package lists... Done
W: Target Packages (main/binary-amd64/Packages) is configured multiple times in /etc/apt/sources.list.d/google-cloud
ud-sdk.list:2
W: Target Packages (main/binary-all/Packages) is configured multiple times in /etc/apt/sources.list.d/google-cloud-s
-sdk.list:2
W: Target Translations (main/i18n/Translation-en) is configured multiple times in /etc/apt/sources.list.d/google-clo
loud-sdk.list:2
W: Target CNF (main/cnf/Commands-amd64) is configured multiple times in /etc/apt/sources.list.d/google-cloud-sdk.lis
ist:2
```

Command:

`sudo apt-get install docker-ce docker-ce-cli containerd.io -y`

Output:

```
root@prajwal-gcloud:~# sudo apt-get install docker-ce docker-ce-cli containerd.io -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
containerd.io is already the newest version (1.4.12-1).
docker-ce-cli is already the newest version (5:20.10.12~3-0~ubuntu-bionic).
docker-ce is already the newest version (5:20.10.12~3-0~ubuntu-bionic).
0 upgraded, 0 newly installed, 0 to remove and 5 not upgraded.
root@prajwal-gcloud:~#
```

Install Golang

Command :

`wget https://storage.googleapis.com/golang/go1.15.4.linux-amd64.tar.gz`

```
root@prajwal-gcloud:~# wget https://storage.googleapis.com/golang/go1.15.4.linux-amd64.tar.gz
--2021-12-27 13:17:19--  https://storage.googleapis.com/golang/go1.15.4.linux-amd64.tar.gz
Resolving storage.googleapis.com (storage.googleapis.com)... 64.233.182.128, 173.194.193.128, 173.194.194.128, ...
Connecting to storage.googleapis.com (storage.googleapis.com)|64.233.182.128|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 120906247 (115M) [application/octet-stream]
Saving to: 'go1.15.4.linux-amd64.tar.gz'

go1.15.4.linux-amd64.tar.gz          100%[===================================================================>
2021-12-27 13:17:20 (143 MB/s) - 'go1.15.4.linux-amd64.tar.gz' saved [120906247/120906247]

root@prajwal-gcloud:~# sudo tar -C /usr/local -xzf go1.15.4.linux-amd64.tar.gz
root@prajwal-gcloud:~# sudo echo 'export PATH=$PATH:/usr/local/go/bin' >> $HOME/.profile
root@prajwal-gcloud:~# sudo echo 'export GOPATH=$HOME/gopath' >> $HOME/.profile
root@prajwal-gcloud:~# source $HOME/.profile
root@prajwal-gcloud:~#
```

Command:
`sudo tar -C /usr/local -xzf go1.15.4.linux-amd64.tar.gz`

`sudo echo 'export PATH=$PATH:/usr/local/go/bin' >> $HOME/.profile`

`sudo echo 'export GOPATH=$HOME/gopath' >> $HOME/.profile`

`source $HOME/.profile`

```
root@prajwal-gcloud:~# sudo tar -C /usr/local -xzf go1.15.4.linux-amd64.tar.gz
root@prajwal-gcloud:~# sudo echo 'export PATH=$PATH:/usr/local/go/bin' >> $HOME/.profile
root@prajwal-gcloud:~# sudo echo 'export GOPATH=$HOME/gopath' >> $HOME/.profile
root@prajwal-gcloud:~# source $HOME/.profile
root@prajwal-gcloud:~#
```

Deploy Arktos cluster

Clone arktos repository and build the Arktos release binaries from a bash terminal from your Arktos source root directory

Command:

mkdir -p $GOPATH/src/github.com

cd $GOPATH/src/github.com

git clone https://github.com/CentaurusInfra/arktos.git

sudo make clean

sudo make quick-release

Output:

```
root@prajwal-gcloud:~# cd $GOPATH/src/github.com
root@prajwal-gcloud:~/gopath/src/github.com# git clone -b  ubuntu-image-fix https://github.com/CentaurusInfra/arktos.git
Cloning into 'arktos'...
fatal: Remote branch ubuntu-image-fix not found in upstream origin
root@prajwal-gcloud:~/gopath/src/github.com# git clone  https://github.com/CentaurusInfra/arktos.git
Cloning into 'arktos'...
remote: Enumerating objects: 104536, done.
remote: Counting objects: 100% (164/164), done.
remote: Compressing objects: 100% (149/149), done.
remote: Total 104536 (delta 42), reused 40 (delta 15), pack-reused 104372
Receiving objects: 100% (104536/104536), 208.31 MiB | 29.75 MiB/s, done.
Resolving deltas: 100% (62982/62982), done.
Checking out files: 100% (20766/20766), done.
root@prajwal-gcloud:~/gopath/src/github.com# cd arktos
root@prajwal-gcloud:~/gopath/src/github.com/arktos# sudo make clean
+++ [1229 07:08:43] Verifying Prerequisites....
root@prajwal-gcloud:~/gopath/src/github.com/arktos# sudo make quick-release
+++ [1229 07:08:47] Verifying Prerequisites....
+++ [1229 07:08:47] Building Docker image kube-build:build-7080d5ea19-5-v1.13.9-2
```

Scenario 1:

Scenario	KUBE_GCI_VERSION	KUBE_GCE_MASTER_PROJECT	KUBE_GCE_NODE_PROJECT
Scenario-1	cos-85-13310-1308-1	cos-cloud	cos-cloud

Modify `cluster/gce/config-default.sh` **to change configurations**

To deploy the arktos cluster on GCE, run kube-up script as follows:

Command:

```
sudo ./cluster/get-kube.sh
```

```
sudo ./cluster/kube-up.sh
```

Output:

```
Zone: us-central1-b
No resources found
Waiting for 4 ready nodes. 0 ready nodes, 0 registered. Retrying.
No resources found
Waiting for 4 ready nodes. 0 ready nodes, 0 registered. Retrying.
Waiting for 4 ready nodes. 0 ready nodes, 4 registered. Retrying.
Found 4 node(s).
NAME                              STATUS                    ROLES     AGE    VERSION
kubernetes-master                 Ready,SchedulingDisabled  <none>    22s    v1.23.1
kubernetes-minion-group-f5rs      Ready                     <none>    19s    v1.23.1
kubernetes-minion-group-kddq      Ready                     <none>    18s    v1.23.1
kubernetes-minion-group-qdgd      Ready                     <none>    19s    v1.23.1
Warning: v1 ComponentStatus is deprecated in v1.19+
Validate output:
Warning: v1 ComponentStatus is deprecated in v1.19+
NAME                 STATUS     MESSAGE                            ERROR
etcd-1               Healthy    {"health":"true","reason":""}
etcd-0               Healthy    {"health":"true","reason":""}
controller-manager   Healthy    ok
scheduler            Healthy    ok
Cluster validation succeeded
Done, listing cluster services:

Kubernetes control plane is running at https://35.239.197.214
GLBCDefaultBackend is running at https://35.239.197.214/api/v1/namespaces/kube-system/services/default-http-backend:http/proxy
CoreDNS is running at https://35.239.197.214/api/v1/namespaces/kube-system/services/kube-dns:dns/proxy
Metrics-server is running at https://35.239.197.214/api/v1/namespaces/kube-system/services/https:metrics-server:/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.

Kubernetes binaries at /root/gopath/src/github.com/arktos/kubernetes/cluster/
You may want to add this directory to your PATH in $HOME/.profile
Installation successful!
```

Install Kubectl:

```
curl -LO "https://dl.k8s.io/release/$(curl -L -s
https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"

curl -LO "https://dl.k8s.io/$(curl -L -s
https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl.sha256"

echo "$(<kubectl.sha256)  kubectl" | sha256sum --check

sudo install -o root -g root -m 0755 kubectl /usr/local/bin/kubectl

kubectl version –client
```

```
You must download release artifacts to continue. You can use
  /root/gopath/src/github.com/arktos/cluster/get-kube-binaries.sh
to do this for your automatically.
root@prajwal-gcloud:~/gopath/src/github.com/arktos# sudo ./cluster/kube-up.sh
... Starting cluster in us-central1-b using provider gce
... calling verify-prereqs
... calling verify-kube-binaries
!!! kubectl appears to be broken or missing
Required release artifacts appear to be missing. Do you wish to download them? [Y/n]
y
Can't determine Kubernetes release.
/root/gopath/src/github.com/arktos/cluster/get-kube-binaries.sh should only be run from a prebuilt Kubernetes release.
Did you mean to use get-kube.sh instead?
root@prajwal-gcloud:~/gopath/src/github.com/arktos# which kubectl
root@prajwal-gcloud:~/gopath/src/github.com/arktos# curl -LO "https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   154  100   154    0     0   7700      0 --:--:-- --:--:-- --:--:--  7700
100 44.4M  100 44.4M    0     0   163M      0 --:--:-- --:--:-- --:--:--  163M
root@prajwal-gcloud:~/gopath/src/github.com/arktos# curl -LO "https://dl.k8s.io/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   154  100   154    0     0   7700      0 --:--:-- --:--:-- --:--:--  7700
100    64  100    64    0     0   1254      0 --:--:-- --:--:-- --:--:--  1254
root@prajwal-gcloud:~/gopath/src/github.com/arktos# echo "$(<kubectl.sha256)  kubectl" | sha256sum --check
kubectl: OK
root@prajwal-gcloud:~/gopath/src/github.com/arktos# sudo install -o root -g root -m 0755 kubectl /usr/local/bin/kubectl
root@prajwal-gcloud:~/gopath/src/github.com/arktos# kubectl version --client
Client Version: version.Info{Major:"1", Minor:"23", GitVersion:"v1.23.1", GitCommit:"86ec240af8cbd1b60bcc4c03c20da9b98005b92e", GitTreeState:"clean", Buil
12-16T11:41:01Z", GoVersion:"go1.17.5", Compiler:"gc", Platform:"linux/amd64"}
root@prajwal-gcloud:~/gopath/src/github.com/arktos# sudo ./cluster/kube-up.sh
```

Check Nodes:

:
```
kubectl get nodes
```

Output:
```
root@prajwal-gcloud:~/go/src/k8s.io/arktos# ./cluster/kubectl.sh get nodes
NAME                              STATUS                     ROLES     AGE      VERSION
kubernetes-master                 Ready,SchedulingDisabled   <none>    2m38s    v0.9.0
kubernetes-minion-group-bq0h      Ready                      <none>    2m37s    v0.9.0
kubernetes-minion-group-q1f8      Ready                      <none>    2m30s    v0.9.0
kubernetes-minion-group-t6hn      Ready                      <none>    2m36s    v0.9.0
root@prajwal-gcloud:~/go/src/k8s.io/arktos#
```

Check Pods:

Command:

```
kubectl get pods -A
```

Output:
```
root@prajwal-gcloud:~/gopath/src/github.com/arktos# kubectl get pods -A
NAMESPACE     NAME                                           READY   STATUS    RESTARTS        AGE
kube-system   coredns-6874cd75d4-dbpr8                       1/1     Running   0               5m7s
kube-system   coredns-6874cd75d4-nrhm4                       1/1     Running   0               5m37s
kube-system   etcd-server-events-kubernetes-master           1/1     Running   0               4m48s
kube-system   etcd-server-kubernetes-master                  1/1     Running   0               4m42s
kube-system   event-exporter-v0.3.4-65b5b5bfdf-dcdgx         1/1     Running   0               5m39s
kube-system   fluentd-gcp-scaler-8bf6d7875-z5vgd             1/1     Running   0               5m37s
kube-system   fluentd-gcp-v3.2.0-4hnnf                       1/1     Running   0               4m47s
kube-system   fluentd-gcp-v3.2.0-hcs78                       1/1     Running   0               5m
kube-system   fluentd-gcp-v3.2.0-mwhnp                       1/1     Running   0               4m43s
kube-system   fluentd-gcp-v3.2.0-pqspc                       1/1     Running   0               5m1s
kube-system   konnectivity-agent-h82pj                       1/1     Running   0               5m16s
kube-system   konnectivity-agent-psx74                       1/1     Running   0               5m16s
kube-system   konnectivity-agent-xggsz                       1/1     Running   0               5m16s
kube-system   konnectivity-server-kubernetes-master          1/1     Running   0               4m59s
kube-system   kube-addon-manager-kubernetes-master           1/1     Running   0               4m44s
kube-system   kube-apiserver-kubernetes-master               1/1     Running   0               4m37s
kube-system   kube-controller-manager-kubernetes-master      1/1     Running   1 (6m4s ago)    4m34s
kube-system   kube-dns-autoscaler-74b9596d57-dq8xm           1/1     Running   0               5m36s
kube-system   kube-proxy-kubernetes-minion-group-f5rs        1/1     Running   0               5m28s
kube-system   kube-proxy-kubernetes-minion-group-kddq        1/1     Running   0               5m27s
kube-system   kube-proxy-kubernetes-minion-group-qdgd        1/1     Running   0               5m29s
kube-system   kube-scheduler-kubernetes-master               1/1     Running   0               4m59s
kube-system   l7-default-backend-c58999b75-fppqg             1/1     Running   0               5m39s
kube-system   l7-lb-controller-kubernetes-master             1/1     Running   2 (5m46s ago)   4m12s
kube-system   metrics-server-v0.5.1-fd46f4f5c-xbjmq          2/2     Running   1 (4m ago)      4m54s
kube-system   volume-snapshot-controller-0                   1/1     Running   0               5m36s
root@prajwal-gcloud:~/gopath/src/github.com/arktos#
```

Arktos cluster tear-down:

To terminate arktos cluster, run the following:

Command:

`./cluster/kube-down.sh`

Output:

```
root@prajwal-gcloud:~/gopath/src/github.com/arktos/cluster# ./kube-down.sh
Bringing down cluster using provider: gce
... calling verify-prereqs
... calling verify-kube-binaries
!!! kubectl appears to be broken or missing
Required release artifacts appear to be missing. Do you wish to download them? [Y/n]
n
You must download release artifacts to continue. You can use
  /root/gopath/src/github.com/arktos/cluster/get-kube-binaries.sh
to do this for your automatically.
```

`./build/run.sh make cross`

```
Exiting with status 1
No changes in generated bindata file: test/e2e/generated/bindata.go
No changes in generated bindata file: pkg/kubectl/generated/bindata.go
WARN: Skipping copyright check for in-container build as git repo is not available
Go version: go version go1.13.9 linux/amd64
+++ [1229 10:02:21] Multiple platforms requested and available 49G >= threshold 40G, building platforms in parallel
+++ [1229 10:02:21] Building go targets for {linux/amd64 linux/arm linux/arm64 linux/s390x linux/ppc64le} in parallel (outpu
    cmd/kubemark
    vendor/github.com/onsi/ginkgo/ginkgo
    test/e2e_node/e2e_node.test
+++ [1229 10:02:21] linux/amd64: build started
Env for linux/amd64: GOOS=linux GOARCH=amd64 GOROOT=/usr/local/go CGO_ENABLED= CC=
Coverage is disabled.
+++ [1229 10:05:01] linux/amd64: build finished
+++ [1229 10:02:21] linux/arm: build started
Env for linux/arm: GOOS=linux GOARCH=arm GOROOT=/usr/local/go CGO_ENABLED=1 CC=arm-linux-gnueabihf-gcc
Coverage is disabled.
+++ [1229 10:04:50] linux/arm: build finished
+++ [1229 10:02:21] linux/arm64: build started
Env for linux/arm64: GOOS=linux GOARCH=arm64 GOROOT=/usr/local/go CGO_ENABLED=1 CC=aarch64-linux-gnu-gcc
Coverage is disabled.
+++ [1229 10:05:09] linux/arm64: build finished
+++ [1229 10:02:21] linux/s390x: build started
Env for linux/s390x: GOOS=linux GOARCH=s390x GOROOT=/usr/local/go CGO_ENABLED=1 CC=s390x-linux-gnu-gcc
Coverage is disabled.
+++ [1229 10:05:24] linux/s390x: build finished
+++ [1229 10:02:21] linux/ppc64le: build started
Env for linux/ppc64le: GOOS=linux GOARCH=ppc64le GOROOT=/usr/local/go CGO_ENABLED=1 CC=powerpc64le-linux-gnu-gcc
Coverage is disabled.
+++ [1229 10:05:27] linux/ppc64le: build finished
+++ [1229 10:05:27] Placing binaries
WARN: Skipping copyright check for in-container build as git repo is not available
+++ [1229 10:06:29] Syncing out of container
+++ [1229 10:06:29] Stopping any currently running rsyncd container
+++ [1229 10:06:29] Starting rsyncd container
+++ [1229 10:06:30] Running rsync
+++ [1229 10:07:21] Stopping any currently running rsyncd container
```

`./cluster/kube-down.sh`

```
root@prajwal-gcloud:~/gopath/src/github.com/arktos# ./cluster/kube-down.sh
Bringing down cluster using provider: gce
... calling verify-prereqs
... calling verify-kube-binaries
... calling kube-down
Project: click2cloud
Network Project: click2cloud
Zone: us-central1-b
INSTANCE_GROUPS=
NODE_NAMES=
Bringing down cluster
teardown total extra server num: 0
Deleting master's reserved IP
Property "current-context" unset.
Property "clusters.click2cloud_kubernetes" unset.
Property "users.click2cloud_kubernetes" unset.
Property "users.click2cloud_kubernetes-basic-auth" unset.
Property "contexts.click2cloud_kubernetes" unset.
Cleared config for click2cloud_kubernetes from /root/.kube/config
Done
```

PASSED

Scenario 2:

Scenario-2	ubuntu-1804-bionic-v20210928	ubuntu-os-cloud	ubuntu-os-cloud

*Modify `cluster/gce/config-default.sh` **to change configurations***

- `KUBE_GCI_VERSION` : provide image name (For eg. `ubuntu-1804-bionic-v20210928`)
- `KUBE_GCE_MASTER_PROJECT`: provide project name(for ubuntu image use `ubuntu-oscloud`)
- `KUBE_GCE_NODE_PROJECT`: provide project name(for ubuntu image use `ubuntu-oscloud`)
- ENABLE_KCM_LEADER_ELECT=${ENABLE_KCM_LEADER_ELECT:-false}
- ENABLE_SCHEDULER_LEADER_ELECT=${ENABLE_SCHEDULER_LEADER_ELECT:-false}

After modification, *To deploy the arktos cluster on GCE, run kube-up script as follows:*

Command:

`./cluster/kube-up.sh`
./cluster/get-kube.sh

```
root@prajwal-gcloud:~/gopath/src/github.com/arktos# sudo ./cluster/kube-up.sh
... Starting cluster in us-central1-b using provider gce
... calling verify-prereqs
... calling verify-kube-binaries
... calling verify-release-tars
!!! Cannot find kubernetes-server-linux-amd64.tar.gz
!!! Cannot find kubernetes-manifests.tar.gz
Required release artifacts appear to be missing. Do you wish to download them? [Y/n]
y
Can't determine Kubernetes release.
/root/gopath/src/github.com/arktos/cluster/get-kube-binaries.sh should only be run from a prebuilt Kubernetes release.
Did you mean to use get-kube.sh instead?
root@prajwal-gcloud:~/gopath/src/github.com/arktos# sudo ./cluster/get-kube.sh
'kubernetes' directory already exist. Should we skip download step and start to create cluster based on it? [Y]/n
y
Skipping download step.
Creating a kubernetes on gce...
... Starting cluster in us-central1-b using provider gce
... calling verify-prereqs
... calling verify-kube-binaries
... calling verify-release-tars
... calling kube-up
Project: click2cloud
Network Project: click2cloud
Zone: us-central1-b
+++ Staging tars to Google Storage: gs://kubernetes-staging-d7e6562b7b/kubernetes-devel
+++ kubernetes-server-linux-amd64.tar.gz uploaded earlier, cloud and local file md5 match (md5 = 7b380f06430d74133893b1241fa3fac1)
+++ kubernetes-manifests.tar.gz uploaded earlier, cloud and local file md5 match (md5 = 51f3fb838d0a9be8232867d67fa96079)
```

Output:

```
... calling validate-cluster
Validating gce cluster, MULTIZONE=
Project: click2cloud
Network Project: click2cloud
Zone: us-central1-b
No resources found
Waiting for 4 ready nodes. 0 ready nodes, 0 registered. Retrying.
No resources found
Waiting for 4 ready nodes. 0 ready nodes, 0 registered. Retrying.
Waiting for 4 ready nodes. 1 ready nodes, 3 registered. Retrying.
Found 4 node(s).
NAME                         STATUS                    ROLES     AGE    VERSION
kubernetes-master            Ready,SchedulingDisabled  <none>    23s    v1.23.1
kubernetes-minion-group-1j88 Ready                     <none>    16s    v1.23.1
kubernetes-minion-group-58jh Ready                     <none>    12s    v1.23.1
kubernetes-minion-group-mkzn Ready                     <none>    19s    v1.23.1
Warning: v1 ComponentStatus is deprecated in v1.19+
Validate output:
Warning: v1 ComponentStatus is deprecated in v1.19+
NAME                STATUS    MESSAGE                            ERROR
etcd-1              Healthy   {"health":"true","reason":""}
etcd-0              Healthy   {"health":"true","reason":""}
controller-manager Healthy   ok
scheduler          Healthy   ok
Cluster validation succeeded
Done, listing cluster services:

Kubernetes control plane is running at https://34.133.233.73
GLBCDefaultBackend is running at https://34.133.233.73/api/v1/namespaces/kube-system/services/default-http-backend:http/proxy
CoreDNS is running at https://34.133.233.73/api/v1/namespaces/kube-system/services/kube-dns:dns/proxy
Metrics-server is running at https://34.133.233.73/api/v1/namespaces/kube-system/services/https:metrics-server:/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.

Kubernetes binaries at /root/gopath/src/github.com/arktos/kubernetes/cluster/
You may want to add this directory to your PATH in $HOME/.profile
Installation successful!
root@prajwal-gcloud:~/gopath/src/github.com/arktos#
```

Check Pods:

Command:

./cluster/kubectl.sh get pods -A

Output:

```
root@prajwal-gcloud:~/gopath/src/github.com/arktos# ./cluster/kubectl.sh get pods -A
NAMESPACE     NAME                                           READY   STATUS    RESTARTS        AGE
kube-system   coredns-6874cd75d4-4z7nr                       1/1     Running   0               3m4s
kube-system   coredns-6874cd75d4-ztb77                       1/1     Running   0               3m34s
kube-system   etcd-server-events-kubernetes-master           1/1     Running   0               2m57s
kube-system   etcd-server-kubernetes-master                  1/1     Running   0               2m45s
kube-system   event-exporter-v0.3.4-65b5b5bfdf-tth9m         1/1     Running   0               3m36s
kube-system   fluentd-gcp-scaler-8bf6d7875-7q2gw             1/1     Running   0               3m33s
kube-system   fluentd-gcp-v3.2.0-2gxtg                       1/1     Running   0               2m43s
kube-system   fluentd-gcp-v3.2.0-nh55l                       1/1     Running   0               2m54s
kube-system   fluentd-gcp-v3.2.0-tnt44                       1/1     Running   0               2m51s
kube-system   fluentd-gcp-v3.2.0-vwlls                       1/1     Running   0               2m47s
kube-system   konnectivity-agent-dc56c                       1/1     Running   0               3m5s
kube-system   konnectivity-agent-kblr4                       1/1     Running   0               3m12s
kube-system   konnectivity-agent-q9hjd                       1/1     Running   0               3m12s
kube-system   konnectivity-server-kubernetes-master          1/1     Running   0               2m56s
kube-system   kube-addon-manager-kubernetes-master           1/1     Running   0               2m37s
kube-system   kube-apiserver-kubernetes-master               1/1     Running   0               2m46s
kube-system   kube-controller-manager-kubernetes-master      1/1     Running   1 (3m59s ago)   2m40s
kube-system   kube-dns-autoscaler-74b9596d57-lq8fr           1/1     Running   0               3m33s
kube-system   kube-proxy-kubernetes-minion-group-1j88        1/1     Running   0               3m22s
kube-system   kube-proxy-kubernetes-minion-group-58jh        1/1     Running   0               3m18s
kube-system   kube-proxy-kubernetes-minion-group-mkzn        1/1     Running   0               3m26s
kube-system   kube-scheduler-kubernetes-master               1/1     Running   0               2m39s
kube-system   l7-default-backend-c58999b75-d7mlt             1/1     Running   0               3m36s
kube-system   l7-lb-controller-kubernetes-master             1/1     Running   2 (3m47s ago)   2m2s
kube-system   metrics-server-v0.5.1-fd46f4f5c-2lzbj          2/2     Running   1 (116s ago)    2m46s
kube-system   volume-snapshot-controller-0                   1/1     Running   0               3m33s
root@prajwal-gcloud:~/gopath/src/github.com/arktos#
```

Check Nodes:

./cluster/kubectl.sh get nodes

Output:

```
root@prajwal-gcloud:~/gopath/src/github.com/arktos# ./cluster/kubectl.sh get nodes
NAME                              STATUS                   ROLES     AGE      VERSION
kubernetes-master                 Ready,SchedulingDisabled <none>    3m54s    v1.23.1
kubernetes-minion-group-1j88      Ready                    <none>    3m47s    v1.23.1
kubernetes-minion-group-58jh      Ready                    <none>    3m43s    v1.23.1
kubernetes-minion-group-mkzn      Ready                    <none>    3m50s    v1.23.1
root@prajwal-gcloud:~/gopath/src/github.com/arktos#
```

Arktos cluster tear-down:

To terminate arktos cluster, run the following:

Command:

./cluster/kube-down.sh

Output:

```
...Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/zones/us-central1-b/instanceGroupManagers/kubernetes-minion
done.
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/instanceTemplates/kubernetes-minion-template].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/instanceTemplates/kubernetes-windows-node-template].
teardown total extra server num: 0
Warning: Permanently added 'compute.7116430641366927470' (ED25519) to the list of known hosts.
root@34.133.233.73: Permission denied (publickey).
ERROR: (gcloud.compute.ssh) [/usr/bin/ssh] exited with return code [255].
Removing etcd replica, name: kubernetes-master, port: 2379, result: 255
root@34.133.233.73: Permission denied (publickey).
ERROR: (gcloud.compute.ssh) [/usr/bin/ssh] exited with return code [255].
Removing etcd replica, name: kubernetes-master, port: 4002, result: 255
Updated [https://www.googleapis.com/compute/v1/projects/click2cloud/zones/us-central1-b/instances/kubernetes-master].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/zones/us-central1-b/instances/kubernetes-master].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/firewalls/kubernetes-master-https].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/firewalls/kubernetes-master-etcd].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/firewalls/kubernetes-minion-all].
Deleting master's reserved IP
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/regions/us-central1/addresses/kubernetes-master-ip].
Deleting routes kubernetes-aa9d5cab-89a6-43c1-be68-9465cd917a6f
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/routes/kubernetes-aa9d5cab-89a6-43c1-be68-9465cd917a6f]
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/firewalls/kubernetes-default-internal-master].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/firewalls/kubernetes-default-internal-node].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/firewalls/default-default-ssh].
Property "current-context" unset.
Property "clusters.click2cloud_kubernetes" unset.
Property "users.click2cloud_kubernetes" unset.
Property "users.click2cloud_kubernetes-basic-auth" unset.
Property "contexts.click2cloud_kubernetes" unset.
Cleared config for click2cloud_kubernetes from /root/.kube/config
Done
```

PASSED

Scenario 3:

Scenario-3	image-1	click2cloud	click2cloud

Modify `cluster/gce/config-default.sh` **to change configurations** *To use ubuntu image user will need to change following parameters:*

- `KUBE_GCI_VERSION` : provide image name (image-1)
- `KUBE_GCE_MASTER_PROJECT`: provide project name(click2cloud)
- `KUBE_GCE_NODE_PROJECT`: provide project name(click2cloud)
- ENABLE_KCM_LEADER_ELECT=${ENABLE_KCM_LEADER_ELECT:-false}
- ENABLE_SCHEDULER_LEADER_ELECT=${ENABLE_SCHEDULER_LEADER_ELECT:-false}

After Modifications

To deploy the arktos cluster on GCE, run kube-up script as follows:

Command:

```
sudo ./cluster/kube-up.sh
sudo ./cluster/get-kube.sh
```

```
root@prajwal-gcloud:~/gopath/src/github.com/arktos# vi cluster/gce/config-default.sh
root@prajwal-gcloud:~/gopath/src/github.com/arktos# sudo ./cluster/kube-up.sh
... Starting cluster in us-central1-b using provider gce
... calling verify-prereqs
... calling verify-kube-binaries
... calling verify-release-tars
!!! Cannot find kubernetes-server-linux-amd64.tar.gz
!!! Cannot find kubernetes-manifests.tar.gz
Required release artifacts appear to be missing. Do you wish to download them? [Y/n]
y
Can't determine Kubernetes release.
/root/gopath/src/github.com/arktos/cluster/get-kube-binaries.sh should only be run from a prebuilt Kubernetes release.
Did you mean to use get-kube.sh instead?
root@prajwal-gcloud:~/gopath/src/github.com/arktos# sudo ./cluster/get-kube.sh
'kubernetes' directory already exist. Should we skip download step and start to create cluster based on it? [Y]/n
y
Skipping download step.
Creating a kubernetes on gce...
... Starting cluster in us-central1-b using provider gce
... calling verify-prereqs
... calling verify-kube-binaries
... calling verify-release-tars
... calling kube-up
Project: click2cloud
Network Project: click2cloud
Zone: us-central1-b
+++ Staging tars to Google Storage: gs://kubernetes-staging-d7e6562b7b/kubernetes-devel
+++ kubernetes-server-linux-amd64.tar.gz uploaded earlier, cloud and local file md5 match (md5 = 7b380f06430d74133893b12
+++ kubernetes-manifests.tar.gz uploaded earlier, cloud and local file md5 match (md5 = 51f3fb838d0a9be8232867d67fa96079
```

Output:

```
... calling validate-cluster
Validating gce cluster, MULTIZONE=
Project: click2cloud
Network Project: click2cloud
Zone: us-central1-b
No resources found
Waiting for 4 ready nodes. 0 ready nodes, 0 registered. Retrying.
No resources found
Waiting for 4 ready nodes. 0 ready nodes, 0 registered. Retrying.
Waiting for 4 ready nodes. 0 ready nodes, 2 registered. Retrying.
Found 4 node(s).
NAME                          STATUS                   ROLES     AGE    VERSION
kubernetes-master             Ready,SchedulingDisabled <none>    22s    v1.23.1
kubernetes-minion-group-hwrv  Ready                    <none>    14s    v1.23.1
kubernetes-minion-group-jhfz  Ready                    <none>    18s    v1.23.1
kubernetes-minion-group-swst  Ready                    <none>    13s    v1.23.1
Warning: v1 ComponentStatus is deprecated in v1.19+
Validate output:
Warning: v1 ComponentStatus is deprecated in v1.19+
NAME                STATUS    MESSAGE                             ERROR
etcd-1              Healthy   {"health":"true","reason":""}
etcd-0              Healthy   {"health":"true","reason":""}
controller-manager  Healthy   ok
scheduler           Healthy   ok
Cluster validation succeeded
Done, listing cluster services:

Kubernetes control plane is running at https://35.239.197.214
GLBCDefaultBackend is running at https://35.239.197.214/api/v1/namespaces/kube-system/services/default-http-backend:http/proxy
CoreDNS is running at https://35.239.197.214/api/v1/namespaces/kube-system/services/kube-dns:dns/proxy
Metrics-server is running at https://35.239.197.214/api/v1/namespaces/kube-system/services/https:metrics-server:/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.

Kubernetes binaries at /root/gopath/src/github.com/arktos/kubernetes/cluster/
You may want to add this directory to your PATH in $HOME/.profile
Installation successful!
root@prajwal-gcloud:~/gopath/src/github.com/arktos#
```

Check Pods:

Command:

./cluster/kubectl.sh get pods -A

Output:

```
root@prajwal-gcloud:~/gopath/src/github.com/arktos# ./cluster/kubectl.sh get pods -A
NAMESPACE       NAME                                         READY   STATUS    RESTARTS        AGE
kube-system     coredns-6874cd75d4-8c6hp                     1/1     Running   0               104s
kube-system     coredns-6874cd75d4-9pl4x                     1/1     Running   0               74s
kube-system     etcd-server-events-kubernetes-master         1/1     Running   0               50s
kube-system     etcd-server-kubernetes-master                1/1     Running   0               47s
kube-system     event-exporter-v0.3.4-65b5b5bfdf-rkp5s       1/1     Running   0               107s
kube-system     fluentd-gcp-scaler-8bf6d7875-hfjlw           1/1     Running   0               105s
kube-system     fluentd-gcp-v3.2.0-74tx5                     1/1     Running   0               72s
kube-system     fluentd-gcp-v3.2.0-9kwmj                     1/1     Running   0               71s
kube-system     fluentd-gcp-v3.2.0-ff92h                     1/1     Running   0               54s
kube-system     fluentd-gcp-v3.2.0-zfrsl                     1/1     Running   0               57s
kube-system     konnectivity-agent-9ldlv                     1/1     Running   0               86s
kube-system     konnectivity-agent-rncl9                     1/1     Running   0               84s
kube-system     konnectivity-agent-vzvml                     1/1     Running   0               78s
kube-system     konnectivity-server-kubernetes-master        1/1     Running   0               53s
kube-system     kube-addon-manager-kubernetes-master         1/1     Running   0               45s
kube-system     kube-apiserver-kubernetes-master             1/1     Running   0               59s
kube-system     kube-controller-manager-kubernetes-master    1/1     Running   1 (2m10s ago)   54s
kube-system     kube-dns-autoscaler-74b9596d57-4nhhv         1/1     Running   0               104s
kube-system     kube-proxy-kubernetes-minion-group-hwrv      1/1     Running   0               93s
kube-system     kube-proxy-kubernetes-minion-group-jhfz      1/1     Running   0               97s
kube-system     kube-proxy-kubernetes-minion-group-swst      1/1     Running   0               93s
kube-system     l7-default-backend-c58999b75-qrsmk           1/1     Running   0               107s
kube-system     l7-lb-controller-kubernetes-master           1/1     Running   2 (116s ago)    13s
kube-system     metrics-server-v0.5.1-fd46f4f5c-86lj8        2/2     Running   0               64s
kube-system     volume-snapshot-controller-0                 1/1     Running   0               104s
root@prajwal-gcloud:~/gopath/src/github.com/arktos#
```

Check Nodes:

Command:

./cluster/kubectl.sh get nodes

Output:

```
root@prajwal-gcloud:~/gopath/src/github.com/arktos# ./cluster/kubectl.sh get nodes
NAME                               STATUS                    ROLES     AGE      VERSION
kubernetes-master                  Ready,SchedulingDisabled  <none>    3m1s     v1.23.1
kubernetes-minion-group-hwrv       Ready                     <none>    2m53s    v1.23.1
kubernetes-minion-group-jhfz       Ready                     <none>    2m57s    v1.23.1
kubernetes-minion-group-swst       Ready                     <none>    2m52s    v1.23.1
root@prajwal-gcloud:~/gopath/src/github.com/arktos#
```

Arktos cluster tear-down:

To terminate arktos cluster, run the following:

Command:

./cluster/kube-down.sh

Output:

```
Project: click2cloud
Network Project: click2cloud
Zone: us-central1-b
INSTANCE_GROUPS=kubernetes-minion-group
NODE_NAMES=kubernetes-minion-group-hwrv kubernetes-minion-group-jhfz kubernetes-minion-group-swst
Bringing down cluster
Deleting Managed Instance Group...
...Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/zones/us-central1-b/instanceGroupManagers/kubernetes-minion-group].
done.
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/instanceTemplates/kubernetes-minion-template].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/instanceTemplates/kubernetes-windows-node-template].
teardown total extra server num: 0
Warning: Permanently added 'compute.4675735511713809616' (ED25519) to the list of known hosts.
root@35.239.197.214: Permission denied (publickey).
ERROR: (gcloud.compute.ssh) [/usr/bin/ssh] exited with return code [255].
Removing etcd replica, name: kubernetes-master, port: 2379, result: 255
root@35.239.197.214: Permission denied (publickey).
ERROR: (gcloud.compute.ssh) [/usr/bin/ssh] exited with return code [255].
Removing etcd replica, name: kubernetes-master, port: 4002, result: 255
Updated [https://www.googleapis.com/compute/v1/projects/click2cloud/zones/us-central1-b/instances/kubernetes-master].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/zones/us-central1-b/instances/kubernetes-master].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/firewalls/kubernetes-master-https].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/firewalls/kubernetes-master-etcd].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/firewalls/kubernetes-minion-all].
Deleting master's reserved IP
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/regions/us-central1/addresses/kubernetes-master-ip].
Deleting routes kubernetes-a2572fd9-ad1d-4bac-aa18-a6edf3a7bb01
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/routes/kubernetes-a2572fd9-ad1d-4bac-aa18-a6edf3a7bb01].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/firewalls/kubernetes-default-internal-master].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/firewalls/kubernetes-default-internal-node].
Deleted [https://www.googleapis.com/compute/v1/projects/click2cloud/global/firewalls/default-default-ssh].
Property "current-context" unset.
Property "clusters.click2cloud_kubernetes" unset.
Property "users.click2cloud_kubernetes" unset.
Property "users.click2cloud_kubernetes-basic-auth" unset.
Property "contexts.click2cloud_kubernetes" unset.
Cleared config for click2cloud_kubernetes from /root/.kube/config
Done
root@prajwal-gcloud:~/gopath/src/github.com/arktos#
```

PASSED