Test report - Deployment of Arktos Cluster without Mizar CNI on GCP   (Community code)

This document captures the steps to deploy an Arktos cluster lab without Mizar CNI. The machine in this lab used are **n2-standard-16 150 GB storage and Ubuntu 18.04 LTS.**

Step-1: Update kernel (If required)

To check kernel, run following command

`uname -a`

```
root@ashutosh-arkto-machine-1:~# uname -a
Linux ashutosh-arkto-machine-1 5.4.0-1058-gcp #62~18.04.1-Ubuntu SMP Mon Nov 15 07:49:04 UTC 2021 x86_64 x86_64 x86_64 GNU/Linux
root@ashutosh-arkto-machine-1:~#
```

Wget https://raw.githubusercontent.com/CentaurusInfra/mizar/dev

sudo bash kernelupdate.sh

```
root@ashutosh-arkto-machine-1:~# sudo bash kernelupdate.sh
--2021-12-31 05:04:49--  https://mizar.s3.amazonaws.com/linux-5.6-rc2/linux-headers-5.6.0-rc2_5.6.0-rc2-1_amd64.deb
Resolving mizar.s3.amazonaws.com (mizar.s3.amazonaws.com)... 52.216.140.172
Connecting to mizar.s3.amazonaws.com (mizar.s3.amazonaws.com)|52.216.140.172|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 7621020 (7.3M) []
Saving to: '../linux-5.6-rc2/linux-headers-5.6.0-rc2_5.6.0-rc2-1_amd64.deb'

linux-headers-5.6.0-rc2_5.6.0-rc2-1_amd64.deb 100%[================================================>]   7.27M  24.5MB/s   in 0.3s

2021-12-31 05:04:49 (24.5 MB/s) - '../linux-5.6-rc2/linux-headers-5.6.0-rc2_5.6.0-rc2-1_amd64.deb' saved [7621020/7621020]

--2021-12-31 05:04:49--  https://mizar.s3.amazonaws.com/linux-5.6-rc2/linux-image-5.6.0-rc2-dbg_5.6.0-rc2-1_amd64.deb
Resolving mizar.s3.amazonaws.com (mizar.s3.amazonaws.com)... 52.216.140.172
Connecting to mizar.s3.amazonaws.com (mizar.s3.amazonaws.com)|52.216.140.172|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 857827912 (818M) [application/x-www-form-urlencoded]
Saving to: '../linux-5.6-rc2/linux-image-5.6.0-rc2-dbg_5.6.0-rc2-1_amd64.deb'

linux-image-5.6.0-rc2-dbg_5.6.0-rc2-1_amd64.de 100%[================================================>] 818.09M  55.2MB/s   in 16s

2021-12-31 05:05:05 (51.8 MB/s) - '../linux-5.6-rc2/linux-image-5.6.0-rc2-dbg_5.6.0-rc2-1_amd64.deb' saved [857827912/857827912]

--2021-12-31 05:05:05--  https://mizar.s3.amazonaws.com/linux-5.6-rc2/linux-image-5.6.0-rc2_5.6.0-rc2-1_amd64.deb
Resolving mizar.s3.amazonaws.com (mizar.s3.amazonaws.com)... 52.217.106.164
Connecting to mizar.s3.amazonaws.com (mizar.s3.amazonaws.com)|52.217.106.164|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 56427036 (54M) [application/x-www-form-urlencoded]
Saving to: '../linux-5.6-rc2/linux-image-5.6.0-rc2_5.6.0-rc2-1_amd64.deb'

linux-image-5.6.0-rc2_5.6.0-rc2-1_amd64.deb     100%[================================================>]  53.81M  62.4MB/s   in 0.9s

2021-12-31 05:05:07 (62.4 MB/s) - '../linux-5.6-rc2/linux-image-5.6.0-rc2_5.6.0-rc2-1_amd64.deb' saved [56427036/56427036]

--2021-12-31 05:05:07--  https://mizar.s3.amazonaws.com/linux-5.6-rc2/linux-libc-dev_5.6.0-rc2-1_amd64.deb
Resolving mizar.s3.amazonaws.com (mizar.s3.amazonaws.com)... 52.217.106.164
Connecting to mizar.s3.amazonaws.com (mizar.s3.amazonaws.com)|52.217.106.164|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1082248 (1.0M) []
Saving to: '../linux-5.6-rc2/linux-libc-dev_5.6.0-rc2-1_amd64.deb'

linux-libc-dev_5.6.0-rc2-1_amd64.deb            100%[================================================>]   1.03M  4.93MB/s   in 0.2s

2021-12-31 05:05:07 (4.93 MB/s) - '../linux-5.6-rc2/linux-libc-dev_5.6.0-rc2-1_amd64.deb' saved [1082248/1082248]

Continue kernel update (y/n)?
```

```
Saving to: '../linux-5.6-rc2/linux-image-5.6.0-rc2_5.6.0-rc2-1_amd64.deb'

linux-image-5.6.0-rc2_5.6.0-rc2-1_amd64.deb     100%[================================================>]  53.81M  62.4MB/s   in 0.9s

2021-12-31 05:05:07 (62.4 MB/s) - '../linux-5.6-rc2/linux-image-5.6.0-rc2_5.6.0-rc2-1_amd64.deb' saved [56427036/56427036]

--2021-12-31 05:05:07--  https://mizar.s3.amazonaws.com/linux-5.6-rc2/linux-libc-dev_5.6.0-rc2-1_amd64.deb
Resolving mizar.s3.amazonaws.com (mizar.s3.amazonaws.com)... 52.217.106.164
Connecting to mizar.s3.amazonaws.com (mizar.s3.amazonaws.com)|52.217.106.164|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1082248 (1.0M) []
Saving to: '../linux-5.6-rc2/linux-libc-dev_5.6.0-rc2-1_amd64.deb'

linux-libc-dev_5.6.0-rc2-1_amd64.deb            100%[================================================>]   1.03M  4.93MB/s   in 0.2s

2021-12-31 05:05:07 (4.93 MB/s) - '../linux-5.6-rc2/linux-libc-dev_5.6.0-rc2-1_amd64.deb' saved [1082248/1082248]

Continue kernel update (y/n)?y
Updating kernel
Selecting previously unselected package linux-headers-5.6.0-rc2.
(Reading database ... 65653 files and directories currently installed.)
Preparing to unpack .../linux-headers-5.6.0-rc2_5.6.0-rc2-1_amd64.deb ...
Unpacking linux-headers-5.6.0-rc2 (5.6.0-rc2-1) ...
Selecting previously unselected package linux-image-5.6.0-rc2-dbg.
Preparing to unpack .../linux-image-5.6.0-rc2-dbg_5.6.0-rc2-1_amd64.deb ...
Unpacking linux-image-5.6.0-rc2-dbg (5.6.0-rc2-1) ...
Selecting previously unselected package linux-image-5.6.0-rc2.
Preparing to unpack .../linux-image-5.6.0-rc2_5.6.0-rc2-1_amd64.deb ...
Unpacking linux-image-5.6.0-rc2 (5.6.0-rc2-1) ...
Selecting previously unselected package linux-libc-dev:amd64.
Preparing to unpack .../linux-libc-dev_5.6.0-rc2-1_amd64.deb ...
Unpacking linux-libc-dev:amd64 (5.6.0-rc2-1) ...
Setting up linux-headers-5.6.0-rc2 (5.6.0-rc2-1) ...
Setting up linux-image-5.6.0-rc2-dbg (5.6.0-rc2-1) ...
Setting up linux-image-5.6.0-rc2 (5.6.0-rc2-1) ...
update-initramfs: Generating /boot/initrd.img-5.6.0-rc2
Sourcing file `/etc/default/grub'
Sourcing file `/etc/default/grub.d/50-cloudimg-settings.cfg'
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-5.6.0-rc2
Found initrd image: /boot/initrd.img-5.6.0-rc2
Found linux image: /boot/vmlinuz-5.4.0-1058-gcp
Found initrd image: /boot/initrd.img-5.4.0-1058-gcp
Adding boot menu entry for EFI firmware configuration
done
Setting up linux-libc-dev:amd64 (5.6.0-rc2-1) ...
Reboot host (y/n)?
```

Step-2: Install dependencies

Run the following steps to install dependencies required for arktos deployment:

```
sudo mkdir -p $GOPATH/src/github.com
cd $GOPATH/src/github.com
sudo git clone https://github.com/CentaurusInfra/arktos
cd arktos
sudo bash hack/setup-dev-node.sh
export PATH=$PATH:/usr/local/go/bin
sudo -i
cd $GOPATH/src/github.com/arktos
make
```

```
Last login: Fri Dec 31 04:58:05 2021 from 114.143.207.106
root@ashutosh-arkto-machine-1:~# mkdir -p $GOPATH/src/github.com
root@ashutosh-arkto-machine-1:~# cd $GOPATH/src/github.com
root@ashutosh-arkto-machine-1:/src/github.com# git clone https://github.com/CentaurusInfra/arktos
Cloning into 'arktos'...
remote: Enumerating objects: 104576, done.
remote: Counting objects: 100% (204/204), done.
remote: Compressing objects: 100% (176/176), done.
remote: Total 104576 (delta 69), reused 59 (delta 28), pack-reused 104372
Receiving objects: 100% (104576/104576), 207.99 MiB | 40.06 MiB/s, done.
Resolving deltas: 100% (63061/63061), done.
Checking out files: 100% (20766/20766), done.
root@ashutosh-arkto-machine-1:/src/github.com#
```

```
root@ashutosh-arkto-machine-1:/src/github.com/arktos# export PATH=$PATH:/usr/local/go/bin
root@ashutosh-arkto-machine-1:/src/github.com/arktos# go version
go version go1.13.9 linux/amd64
```

Run Arktos

The easiest way to run Arktos is to bring up a single-node cluster in your local development box:

```
hack/arktos-up.sh
```

```
root@ashutosh-arkto-machine-1:/src/github.com/arktos# make
+++ [1231 05:24:40] Building go targets for linux/amd64:
    ./vendor/k8s.io/code-generator/cmd/deepcopy-gen
+++ [1231 05:24:46] Building go targets for linux/amd64:
    ./vendor/k8s.io/code-generator/cmd/defaulter-gen
+++ [1231 05:24:51] Building go targets for linux/amd64:
    ./vendor/k8s.io/code-generator/cmd/conversion-gen
+++ [1231 05:24:59] Building go targets for linux/amd64:
    ./vendor/k8s.io/kube-openapi/cmd/openapi-gen
+++ [1231 05:25:07] Building go targets for linux/amd64:
    ./vendor/github.com/go-bindata/go-bindata/go-bindata
Running copyright check for repo: /src/github.com/arktos, logging to _output/ArktosCopyrightTool.log
/src/github.com/arktos /src/github.com/arktos
warning: inexact rename detection was skipped due to too many files.
warning: you may want to set your diff.renameLimit variable to at least 3067 and retry the command.
/src/github.com/arktos
/src/github.com/arktos /src/github.com/arktos
warning: inexact rename detection was skipped due to too many files.
warning: you may want to set your diff.renameLimit variable to at least 3067 and retry the command.
/src/github.com/arktos
Inspecting copyright files, writing logs to _output/ArktosCopyrightTool.log
Done.
+++ [1231 05:25:16] Building go targets for linux/amd64:
    cmd/kube-proxy
    cmd/kube-apiserver
    cmd/kube-controller-manager
    cmd/cloud-controller-manager
    cmd/workload-controller-manager
    cmd/kubelet
    cmd/kubeadm
    cmd/hyperkube
    cmd/kube-scheduler
    vendor/k8s.io/apiextensions-apiserver
    cluster/gce/gci/mounter
    cmd/kubectl
    cmd/gendocs
    cmd/genkubedocs
    cmd/genman
    cmd/genyaml
    cmd/genswaggertypedocs
    cmd/linkcheck
    vendor/github.com/onsi/ginkgo/ginkgo
    test/e2e/e2e.test
    cmd/kubemark
    vendor/github.com/onsi/ginkgo/ginkgo
    test/e2e_node/e2e_node.test
Running copyright check for repo: /src/github.com/arktos, logging to _output/ArktosCopyrightTool.log
/src/github.com/arktos /src/github.com/arktos
warning: inexact rename detection was skipped due to too many files.
warning: you may want to set your diff.renameLimit variable to at least 3067 and retry the command.
/src/github.com/arktos
/src/github.com/arktos /src/github.com/arktos
warning: inexact rename detection was skipped due to too many files.
warning: you may want to set your diff.renameLimit variable to at least 3067 and retry the command.
/src/github.com/arktos
Inspecting copyright files, writing logs to _output/ArktosCopyrightTool.log
```

```
root@ashutosh-arkto-machine-1:/src/github.com/arktos# systemctl restart containerd.service
root@ashutosh-arkto-machine-1:/src/github.com/arktos# systemctl status containerd.service
 containerd.service - containerd container runtime
   Loaded: loaded (/lib/systemd/system/containerd.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2021-12-31 06:03:58 UTC; 13s ago
     Docs: https://containerd.io
  Process: 21869 ExecStartPre=/sbin/modprobe overlay (code=exited, status=0/SUCCESS)
```

1) Check nodes status:

./cluster/kubectl.sh get nodes

```
root@ashutosh-arkto-machine-1:/src/github.com/arktos# ./cluster/kubectl.sh get nodes
NAME                      STATUS    ROLES     AGE     VERSION
ashutosh-arkto-machine-1  Ready     <none>    20m     v0.9.0
```

Deploy test pods:

Command:

./cluster/kubectl.sh apply -f
https://github.com/Click2CloudCentaurus/Documentation/blob/main/test-yamls/test_pods.yaml

2. Check pods status:

Command

./cluster/kubectl.sh get pods -Ao wide

Output

```
root@ashutosh-arkto-machine-1:/src/github.com/arktos# ./cluster/kubectl.sh get pods -Ao wide
AMESPACE     NAME                             HASHKEY                READY   STATUS    RESTARTS   AGE    IP           NODE                       NOMINATED NODE   READINESS GATES
efault       netpod1                          6171893331122278592    1/1     Running   0          15s    10.88.0.4    ashutosh-arkto-machine-1   <none>           <none>
efault       netpod2                          5863095576436378171    1/1     Running   0          15s    10.88.0.5    ashutosh-arkto-machine-1   <none>           <none>
ube-system   coredns-default-5fd66c4568-jkq6w 1780124503142830713    1/1     Running   0          23m    10.88.0.3    ashutosh-arkto-machine-1   <none>           <none>
ube-system   kube-dns-554c5866fc-tvdfb        1659815913937395144    3/3     Running   0          23m    10.88.0.2    ashutosh-arkto-machine-1   <none>           <none>
ube-system   virtlet-248hm                    916581838429617013     3/3     Running   0          4m28s  10.128.0.48  ashutosh-arkto-machine-1   <none>           <none>
```

Check ping deployed pods:
Command:
./cluster/kubectl.sh exec -it netpod1 ping 10.88.0.5
Output

```
root@ashutosh-arkto-machine-1:/src/github.com/arktos# ./cluster/kubectl.sh exec -it netpod1 ping 10.88.0.5
PING 10.88.0.5 (10.88.0.5) 56(84) bytes of data.
64 bytes from 10.88.0.5: icmp_seq=1 ttl=64 time=0.095 ms
64 bytes from 10.88.0.5: icmp_seq=2 ttl=64 time=0.060 ms
64 bytes from 10.88.0.5: icmp_seq=3 ttl=64 time=0.064 ms
64 bytes from 10.88.0.5: icmp_seq=4 ttl=64 time=0.070 ms
^C
```

Output:

./cluster/kubectl.sh exec -it netpod2 ping 10.88.0.4

```
root@ashutosh-arkto-machine-1:/src/github.com/arktos# ./cluster/kubectl.sh exec -it netpod2 ping 10.88.0.4
PING 10.88.0.4 (10.88.0.4) 56(84) bytes of data.
64 bytes from 10.88.0.4: icmp_seq=1 ttl=64 time=0.063 ms
64 bytes from 10.88.0.4: icmp_seq=2 ttl=64 time=0.073 ms
64 bytes from 10.88.0.4: icmp_seq=3 ttl=64 time=0.070 ms
64 bytes from 10.88.0.4: icmp_seq=4 ttl=64 time=0.069 ms
64 bytes from 10.88.0.4: icmp_seq=5 ttl=64 time=0.073 ms
^C
```