Test report - Deployment of Arktos Cluster without Mizar CNI on Premise

This document captures the steps to deploy an Arktos cluster lab without Mizar CNI. The machine in this lab used are **16 GB RAM, 8 vCPUs, 128 GB storage and Ubuntu 18.04 LTS.**

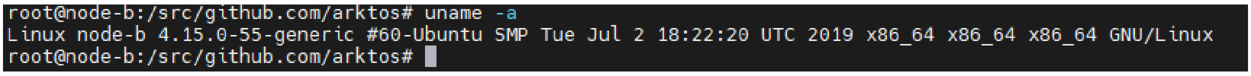
Install golang 1.13.9

Date-16 Dec. 2021

Step-1: Update kernel (If required)

To check kernel, run following command

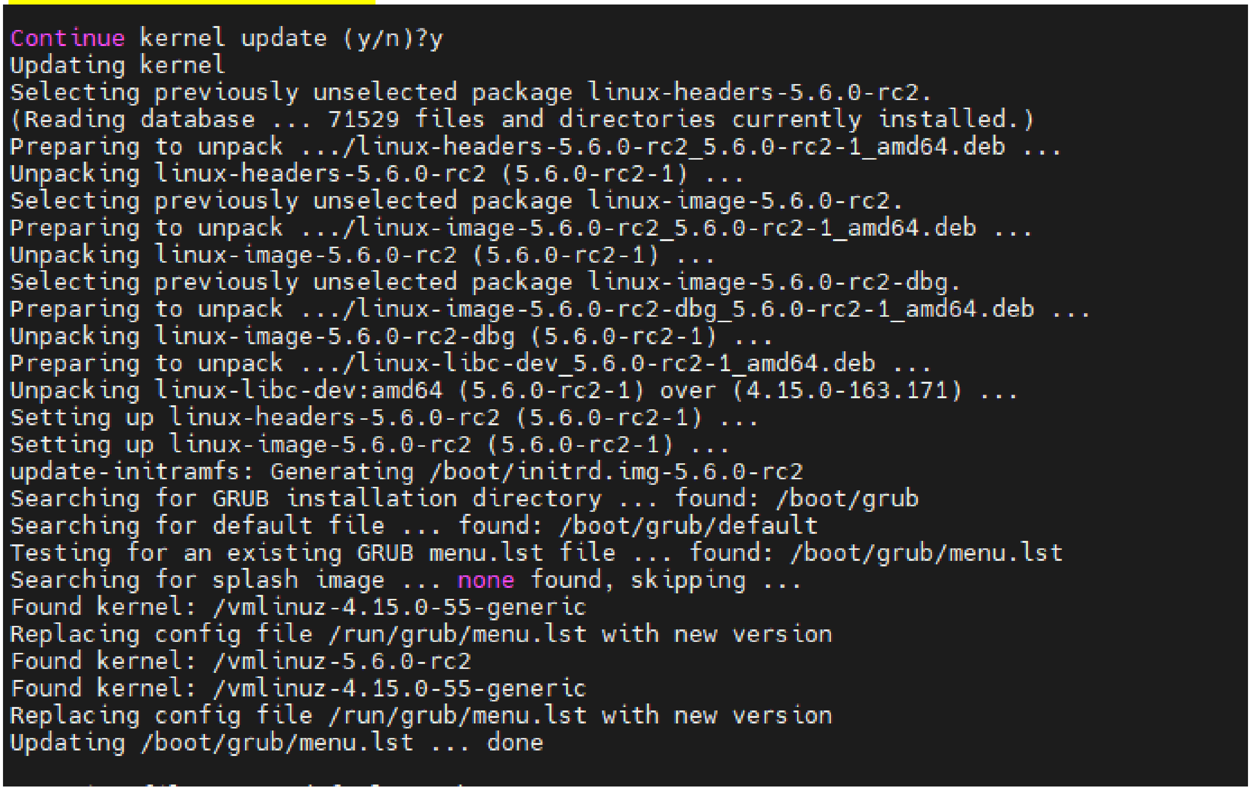
```
uname -a
```



```
root@node-b:/src/github.com/arktos# uname -a
Linux node-b 4.15.0-55-generic #60-Ubuntu SMP Tue Jul 2 18:22:20 UTC 2019 x86_64 x86_64 x86_64 GNU/Linux
root@node-b:/src/github.com/arktos# 
```

Here kernel version is 5.4.0-1051-gcp which is less than the required kernel version, so to update the kernel version to 5.6.0-rc2, we used the following steps :

```
wget https://raw.githubusercontent.com/CentaurusInfra/mizar/dev-next/kernelupdate.sh

sudo bash kernelupdate.sh
```



```
Continue kernel update (y/n)?y
Updating kernel
Selecting previously unselected package linux-headers-5.6.0-rc2.
(Reading database ... 71529 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.
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-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) ...
Preparing to unpack .../linux-libc-dev_5.6.0-rc2-1_amd64.deb ...
Unpacking linux-libc-dev:amd64 (5.6.0-rc2-1) over (4.15.0-163.171) ...
Setting up linux-headers-5.6.0-rc2 (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
Searching for GRUB installation directory ... found: /boot/grub
Searching for default file ... found: /boot/grub/default
Testing for an existing GRUB menu.lst file ... found: /boot/grub/menu.lst
Searching for splash image ... none found, skipping ...
Found kernel: /vmlinuz-4.15.0-55-generic
Replacing config file /run/grub/menu.lst with new version
Found kernel: /vmlinuz-5.6.0-rc2
Found kernel: /vmlinuz-4.15.0-55-generic
Replacing config file /run/grub/menu.lst with new version
Updating /boot/grub/menu.lst ... done
```

Step-2: Install dependencies

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

mkdir -p $GOPATH/src/github.com

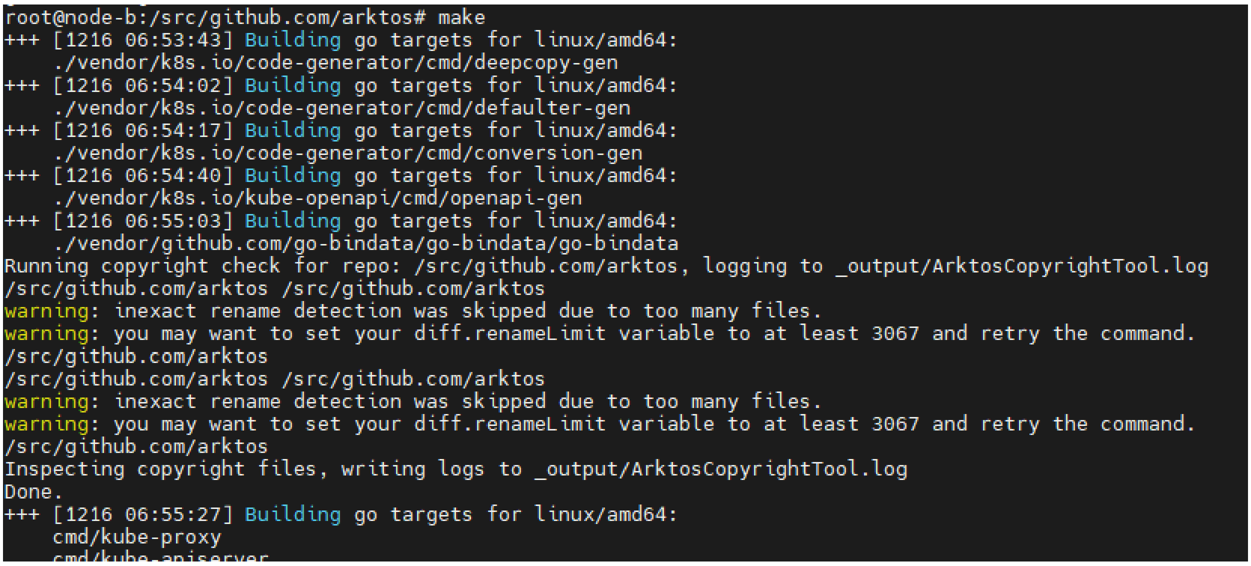
cd $GOPATH/src/github.com

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

cd arktos

sudo bash hack/setup-dev-node.sh

make



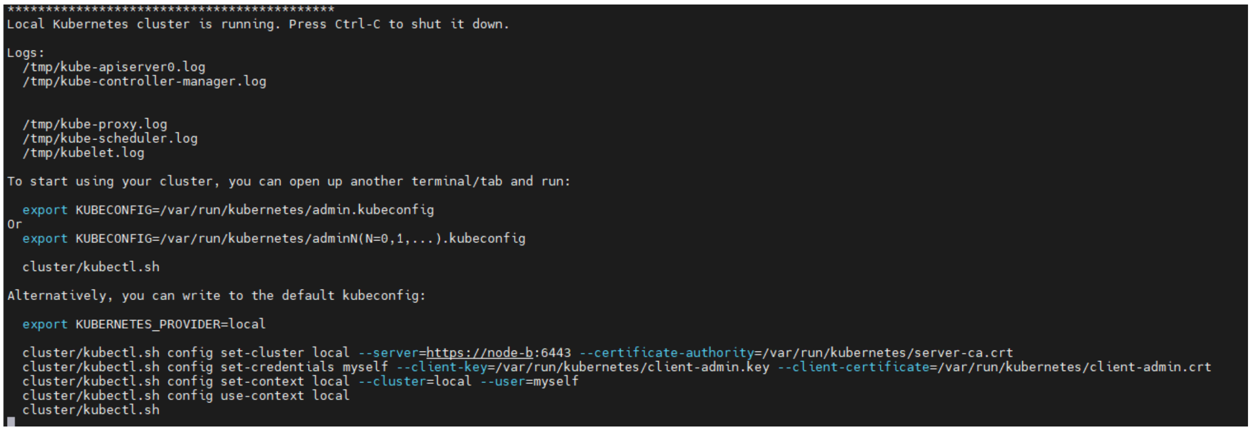
```
root@node-b:/src/github.com/arktos# make
+++ [1216 06:53:43] Building go targets for linux/amd64:
    ./vendor/k8s.io/code-generator/cmd/deepcopy-gen
+++ [1216 06:54:02] Building go targets for linux/amd64:
    ./vendor/k8s.io/code-generator/cmd/defaulter-gen
+++ [1216 06:54:17] Building go targets for linux/amd64:
    ./vendor/k8s.io/code-generator/cmd/conversion-gen
+++ [1216 06:54:40] Building go targets for linux/amd64:
    ./vendor/k8s.io/kube-openapi/cmd/openapi-gen
+++ [1216 06:55:03] 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.
+++ [1216 06:55:27] Building go targets for linux/amd64:
    cmd/kube-proxy
    cmd/kube-apiserver
```

Run Arktos

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

cd $GOPATH/src/github.com/arktos

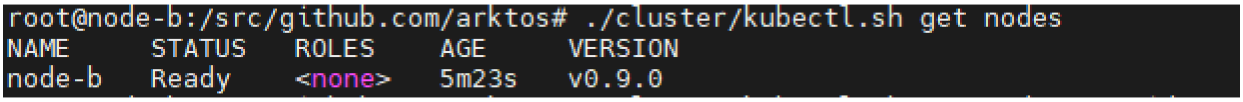
hack/arktos-up.sh



```
********************************************
Local Kubernetes cluster is running. Press Ctrl-C to shut it down.

Logs:
  /tmp/kube-apiserver0.log
  /tmp/kube-controller-manager.log


  /tmp/kube-proxy.log
  /tmp/kube-scheduler.log
  /tmp/kubelet.log

To start using your cluster, you can open up another terminal/tab and run:

  export KUBECONFIG=/var/run/kubernetes/admin.kubeconfig
Or
  export KUBECONFIG=/var/run/kubernetes/adminN(N=0,1,...).kubeconfig

  cluster/kubectl.sh

Alternatively, you can write to the default kubeconfig:

  export KUBERNETES_PROVIDER=local

  cluster/kubectl.sh config set-cluster local --server=https://node-b:6443 --certificate-authority=/var/run/kubernetes/server-ca.crt
  cluster/kubectl.sh config set-credentials myself --client-key=/var/run/kubernetes/client-admin.key --client-certificate=/var/run/kubernetes/client-admin.crt
  cluster/kubectl.sh config set-context local --cluster=local --user=myself
  cluster/kubectl.sh config use-context local
  cluster/kubectl.sh
```

1) Check nodes status:

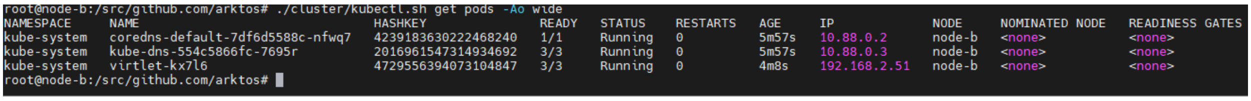
./cluster/kubectl.sh get nodes



```
root@node-b:/src/github.com/arktos# ./cluster/kubectl.sh get nodes
NAME     STATUS   ROLES    AGE     VERSION
node-b   Ready    <none>   5m23s   v0.9.0
```

2) Check pods status:

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



```
root@node-b:/src/github.com/arktos# ./cluster/kubectl.sh get pods -Ao wide
NAMESPACE     NAME                                 HASHKEY               READY   STATUS    RESTARTS   AGE     IP            NODE     NOMINATED NODE   READINESS GATES
kube-system   coredns-default-7df6d5588c-nfwq7     4239183630222468240   1/1     Running   0          5m57s   10.88.0.2     node-b   <none>           <none>
kube-system   kube-dns-554c5866fc-7695r            2016961547314934692   3/3     Running   0          5m57s   10.88.0.3     node-b   <none>           <none>
kube-system   virtlet-kx7l6                        4729556394073104847   3/3     Running   0          4m8s    192.168.2.51  node-b   <none>           <none>
root@node-b:/src/github.com/arktos#
```

Deploy test pods:

Command:

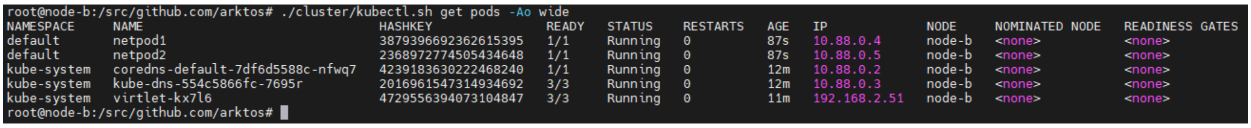
./cluster/kubectl.sh apply -f https://github.com/Click2Cloud-Centaurus/Documentation/blob/main/test-yamls/test_pods.yaml

Check deployed pods:

Command:

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

Output



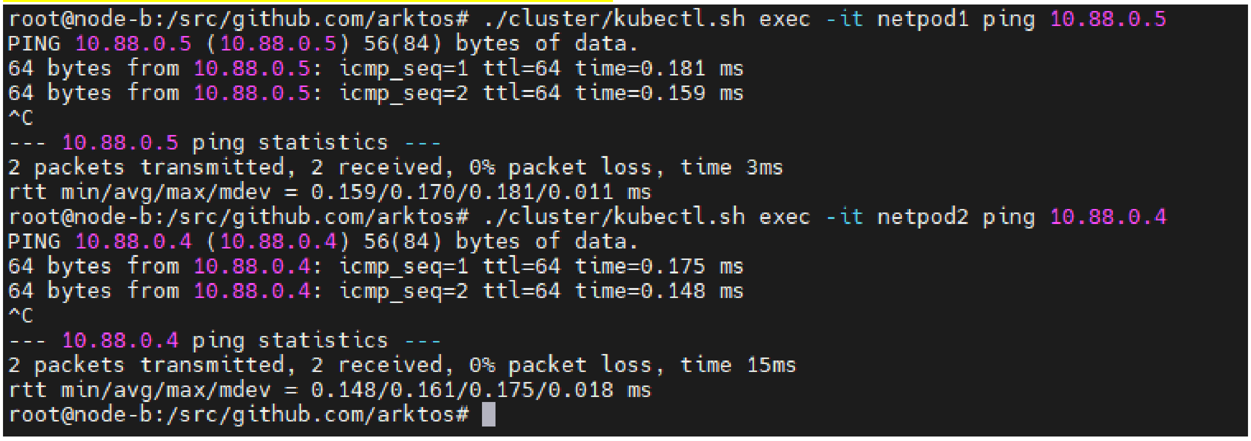
```
root@node-b:/src/github.com/arktos# ./cluster/kubectl.sh get pods -Ao wide
NAMESPACE     NAME                                 HASHKEY               READY   STATUS    RESTARTS   AGE   IP            NODE     NOMINATED NODE   READINESS GATES
default       netpod1                              3879396692362615395   1/1     Running   0          87s   10.88.0.4     node-b   <none>           <none>
default       netpod2                              2368972774505434648   1/1     Running   0          87s   10.88.0.5     node-b   <none>           <none>
kube-system   coredns-default-7df6d5588c-nfwq7     4239183630222468240   1/1     Running   0          12m   10.88.0.2     node-b   <none>           <none>
kube-system   kube-dns-554c5866fc-7695r            2016961547314934692   3/3     Running   0          12m   10.88.0.3     node-b   <none>           <none>
kube-system   virtlet-kx7l6                        4729556394073104847   3/3     Running   0          11m   192.168.2.51  node-b   <none>           <none>
root@node-b:/src/github.com/arktos#
```

Check ping deployed pods:

Command:

./cluster/kubectl.sh exec -it netpod1 ping 10.88.0.5

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



```
root@node-b:/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=0.181 ms
64 bytes from 10.88.0.5: icmp_seq=2 ttl=64 time=0.159 ms
^C
--- 10.88.0.5 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 3ms
rtt min/avg/max/mdev = 0.159/0.170/0.181/0.011 ms
root@node-b:/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=0.175 ms
64 bytes from 10.88.0.4: icmp_seq=2 ttl=64 time=0.148 ms
^C
--- 10.88.0.4 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 15ms
rtt min/avg/max/mdev = 0.148/0.161/0.175/0.018 ms
root@node-b:/src/github.com/arktos#
```