

Arktos Deployment with Mizar CNI (On Prem)

Prerequisite:

For On-prem setup, the preferred OS is **Ubuntu 18.04**. The recommended instance size is **8 CPU** and **32GB RAM** and the storage size is **128GB** or more. The steps might change with the progress of development.

Steps:

1. Check the kernel version:

Command:

```
uname -a
```

Output:

```
amit@amit:~$ uname -a
Linux amit 4.15.0-158-generic #166-Ubuntu SMP Fri Sep 17 19:37:52 UTC 2021 x86_64 x86_64 x86_64 GNU/Linux
```

Update the kernel if the kernel version is below 5.6.0-rc2

Command:

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

Output:

```
amit@amit:~$ wget https://raw.githubusercontent.com/CentaurusInfra/mizar/dev-next/kernelupdate.sh
--2021-09-29 09:40:24-- https://raw.githubusercontent.com/CentaurusInfra/mizar/dev-next/kernelupdate.sh
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.108.133, 185.199.111.133, 185.199.110.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.108.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 791 [text/plain]
Saving to: 'kernelupdate.sh'

kernelupdate.sh          100%[=====] 791  --.-KB/s  in 0s

2021-09-29 09:40:24 (16.4 MB/s) - 'kernelupdate.sh' saved [791/791]
```

```
sudo bash kernelupdate.sh
```

Output:

```
(Reading database ... 67144 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) ...
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 (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-4.15.0-158-generic
Replacing config file /run/grub/menu.lst with new version
Found kernel: /vmlinuz-5.6.0-rc2
Found kernel: /vmlinuz-4.15.0-158-generic
Replacing config file /run/grub/menu.lst with new version
Updating /boot/grub/menu.lst ... done

Sourcing file '/etc/default/grub'
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-4.15.0-158-generic
Found initrd image: /boot/initrd.img-4.15.0-158-generic
done
Setting up linux-image-5.6.0-rc2-dbg (5.6.0-rc2-1) ...
Setting up linux-libc-dev:amd64 (5.6.0-rc2-1) ...
Reboot host (y/n)?y
Rebooting
```

```
amit@amit:~$ uname -a
Linux amit 5.6.0-rc2 #1 SMP Tue Feb 25 18:54:05 UTC 2020 x86_64 x86_64 x86_64 GNU/Linux
```

2. Clone the Arktos repository and install the required dependencies:

Command:

```
git clone https://github.com/Click2Cloud-Centaurus/arktos.git ~/go/src/k8s.io/arktos
-b default-cni-mizar
```

Output:

```
amit@amit:~$ git clone https://github.com/Click2Cloud-Centaurus/arktos.git ~/go/src/k8s.io/arktos -b default-cni-mizar
Cloning into '/home/amit/go/src/k8s.io/arktos'...
remote: Enumerating objects: 104467, done.
remote: Counting objects: 100% (1130/1130), done.
remote: Compressing objects: 100% (683/683), done.
remote: Total 104467 (delta 564), reused 635 (delta 431), pack-reused 103337
Receiving objects: 100% (104467/104467), 333.11 MiB | 9.89 MiB/s, done.
Resolving deltas: 100% (63151/63151), done.
Checking out files: 100% (20762/20762), done.
```

Command

```
sudo bash $HOME/go/src/k8s.io/arktos/hack/setup-dev-node.sh
```

Output:

```

Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for libc-bin (2.27-3ubuntu1.2) ...
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libjq1 libonig4
The following NEW packages will be installed:
  jq libjq1 libonig4
0 upgraded, 3 newly installed, 0 to remove and 68 not upgraded.
Need to get 276 kB of archives.
After this operation, 930 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libonig4 amd64 6.7.0-1 [119 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libjq1 amd64 1.5+dfsg-2 [111 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 jq amd64 1.5+dfsg-2 [45.6 kB]
Fetched 276 kB in 0s (1,020 kB/s)
Selecting previously unselected package libonig4:amd64.
(Reading database ... 102329 files and directories currently installed.)
Preparing to unpack .../libonig4_6.7.0-1_amd64.deb ...
Unpacking libonig4:amd64 (6.7.0-1) ...
Selecting previously unselected package libjq1:amd64.
Preparing to unpack .../libjq1_1.5+dfsg-2_amd64.deb ...
Unpacking libjq1:amd64 (1.5+dfsg-2) ...
Selecting previously unselected package jq.
Preparing to unpack .../jq_1.5+dfsg-2_amd64.deb ...
Unpacking jq (1.5+dfsg-2) ...
Setting up libonig4:amd64 (6.7.0-1) ...
Setting up libjq1:amd64 (1.5+dfsg-2) ...
Setting up jq (1.5+dfsg-2) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for libc-bin (2.27-3ubuntu1.2) ...
Install golang.
--2021-09-29 10:48:05-- https://dl.google.com/go/go1.13.9.linux-amd64.tar.gz
Resolving dl.google.com (dl.google.com)... 142.250.183.46, 2404:6800:4009:82d::200e
Connecting to dl.google.com (dl.google.com)[142.250.183.46]:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 120139686 (115M) [application/octet-stream]
Saving to: '/tmp/go1.13.9.linux-amd64.tar.gz'

go1.13.9.linux-amd64.tar.gz      100%[=====] 114.57M  3.22MB/s   in 41s

2021-09-29 10:48:48 (2.79 MB/s) - '/tmp/go1.13.9.linux-amd64.tar.gz' saved [120139686/120139686]

Done.

```

Command:

```

echo export PATH=$PATH:/usr/local/go/bin\ >> ~/.profile
echo cd \${HOME}/go/src/k8s.io/arktos >> ~/.profile
source ~/.profile

```

Output:

```

amit@amit:~$ echo export PATH=$PATH:/usr/local/go/bin\ >> ~/.profile
amit@amit:~$ echo cd \${HOME}/go/src/k8s.io/arktos >> ~/.profile
amit@amit:~$ source ~/.profile

```

3. Start Arktos cluster

Command:

```
CNIPLUGIN=mizar ./hack/arktos-up.sh
```

Output:

```

amit@amit:~/go/src/k8s.io/arktos$ CNIPLUGIN=mizar ./hack/arktos-up.sh
DBG: Flannel CNI plugin will be installed AFTER cluster is up
DBG: effective feature gates AllAlpha=false,WorkloadInfoDefaulting=true,QPSDoubleGCController=true,QPSDoubleRSController=true,MandatoryArktosNetwork=true
DBG: effective disabling admission plugins
DBG: effective default network template file is /home/amit/go/src/k8s.io/arktos/hack/testdata/default-flat-network.tpl
DBG: kubelet arg RESOLV_CONF is /run/systemd/resolve/resolve.conf
WARNING : The kubelet is configured to not fail even if swap is enabled; production deployments should disable swap.
WARNING : This script MAY be run as root for docker socket / iptables functionality; if failures occur, retry as root.
Containerd is required for Arktos

```

After restarting containerd with command

sudo service containerd restart

Output:

```
*****
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/admin(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://amit: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
```

4. Leave the "arktos-up.sh" terminal and open another terminal to the master node. Verify mizar pods i.e. mizar-operator and mizar-daemon pods are in running state, for that run:

Command:

```
./cluster/kubectl.sh get pods
```

Output:

```
amit@amit:~/go/src/k8s.io/arktos$ ./cluster/kubectl.sh get pods
NAME                                HASHKEY                                READY    STATUS    RESTARTS   AGE
mizar-daemon-75fvs                  7365993231135397748                  1/1     Running   0           15m
mizar-operator-6985d77546-lc5rw     7639524822487720563                  1/1     Running   0           15m
```

Check VPCs:

Command:

```
./cluster/kubectl.sh get vpcs
```

Output:

```
amit@amit:~/go/src/k8s.io/arktos$ ./cluster/kubectl.sh get vpcs
NAME  IP        PREFIX  VNI  DIVIDERS  STATUS  CREATETIME                PROVISIONDELAY
vpc0  20.0.0.0  8       1    1         Init   2021-09-29T11:05:52.016302
```

Check Subnets:

Command:

```
./cluster/kubectl.sh get subnets
```

Output:

```
amit@amit:~/go/src/k8s.io/arktos$ ./cluster/kubect1.sh get subnets
NAME IP PREFIX VNI VPC STATUS BOUNCERS CREATETIME PROVISIONDELAY
net0 20.0.0.0 8 1 vpc0 Init 1 2021-09-29T11:05:52.170279
```

Check Bouncers:

Command:

```
./cluster/kubect1.sh get bouncers
```

Output:

```
amit@amit:~/go/src/k8s.io/arktos$ ./cluster/kubect1.sh get bouncers
NAME VPC NET IP MAC DROPLET STATUS CREATETIME PROVISIONDELAY
net0-b-dc25ec6a-ba6f-4064-b55c-cfc515588e9b vpc0 net0 amit Provisioned 2021-09-29T11:41:24.163569 2.153071
```

Check dividers:

Command:

```
./cluster/kubect1.sh get dividers
```

Output:

```
amit@amit:~/go/src/k8s.io/arktos$ ./cluster/kubect1.sh get dividers
NAME VPC IP MAC DROPLET STATUS CREATETIME PROVISIONDELAY
vpc0-d-c4be8eac-3a91-4b65-b9b9-c45c327726d4 vpc0 amit Provisioned 2021-09-29T11:41:02.506627 1.833161
```

Check Nodes:

Command:

```
./cluster/kubect1.sh get dividers
```

Output:

```
amit@amit:~/go/src/k8s.io/arktos$ ./cluster/kubect1.sh get node
NAME STATUS ROLES AGE VERSION
amit Ready <none> 40m v0.8.0
```