Arktos deployment without Mizar CNI (On Premise)

Date-10 Dec. 2021

This document is intended for new users to install the Arktos platform without Mizar as the underlying network technology.

Prepare a machine of 16 Gb RAM, 8 vCPUs, 128G Storage, Ubuntu 18.04 LTS.

1. Check the kernel version:

Command:

uname -a

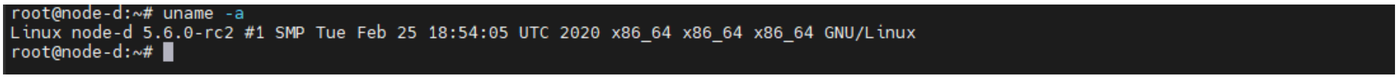
Update the kernel if the kernel version is below `5.6.0-rc2`

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

sudo bash kernelupdate.sh

uname -a

Output:



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

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

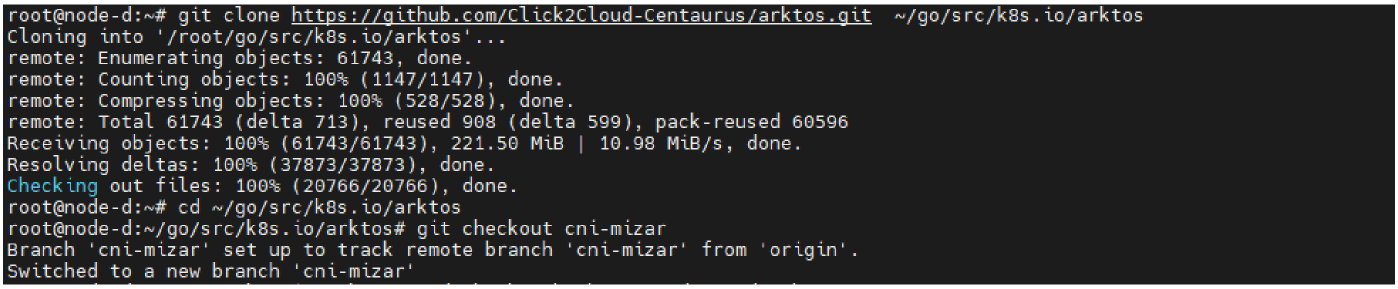
git clone https://github.com/Click2Cloud-Centaurus/arktos.git ~/go/src/k8s.io/arktos

cd ~/go/src/k8s.io/arktos

git checkout cni-mizar

sudo bash ./hack/setup-dev-node.sh

Output:



```
root@node-d:~# git clone https://github.com/Click2Cloud-Centaurus/arktos.git  ~/go/src/k8s.io/arktos
Cloning into '/root/go/src/k8s.io/arktos'...
remote: Enumerating objects: 61743, done.
remote: Counting objects: 100% (1147/1147), done.
remote: Compressing objects: 100% (528/528), done.
remote: Total 61743 (delta 713), reused 908 (delta 599), pack-reused 60596
Receiving objects: 100% (61743/61743), 221.50 MiB | 10.98 MiB/s, done.
Resolving deltas: 100% (37873/37873), done.
Checking out files: 100% (20766/20766), done.
root@node-d:~# cd ~/go/src/k8s.io/arktos
root@node-d:~/go/src/k8s.io/arktos# git checkout cni-mizar
Branch 'cni-mizar' set up to track remote branch 'cni-mizar' from 'origin'.
Switched to a new branch 'cni-mizar'
```

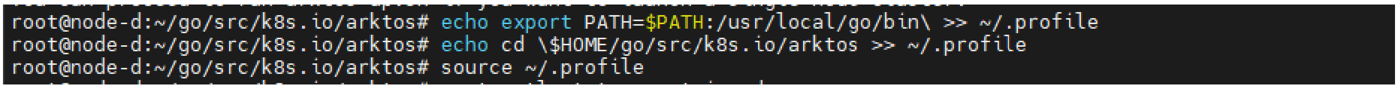
Command:

echo export PATH=$PATH:/usr/local/go/bin\ >> ~/.profile

echo cd \$HOME/go/src/k8s.io/arktos >> ~/.profile

source ~/.profile

Output:



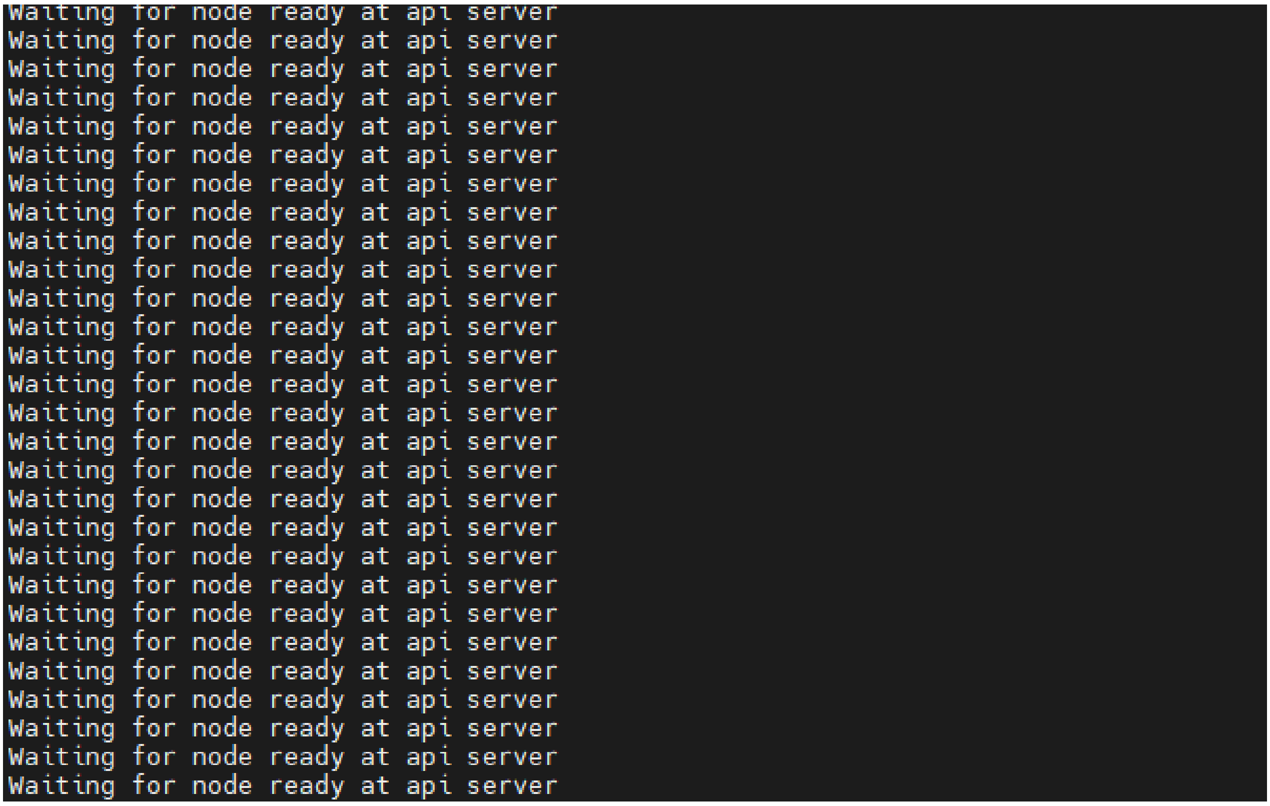
```
root@node-d:~/go/src/k8s.io/arktos# echo export PATH=$PATH:/usr/local/go/bin\ >> ~/.profile
root@node-d:~/go/src/k8s.io/arktos# echo cd \$HOME/go/src/k8s.io/arktos >> ~/.profile
root@node-d:~/go/src/k8s.io/arktos# source ~/.profile
```

3. Start Arktos cluster

Command:

`./hack/arktos-up.sh`

The terminal was stuck in this state.



```
Waiting for node ready at api server
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```
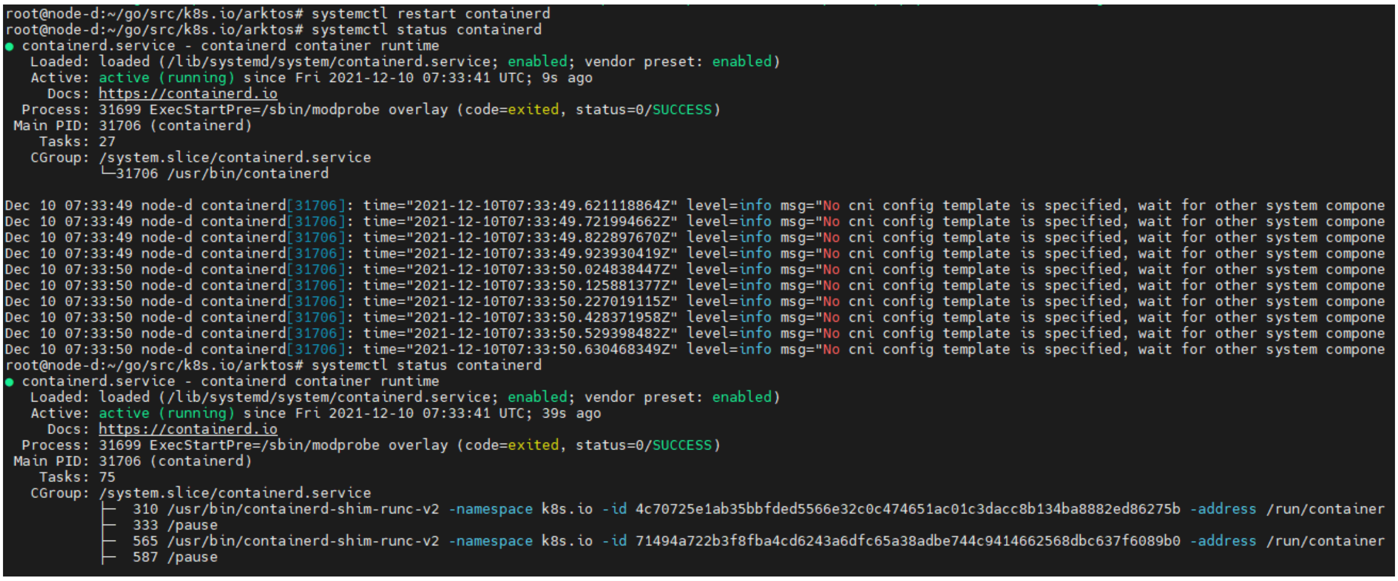
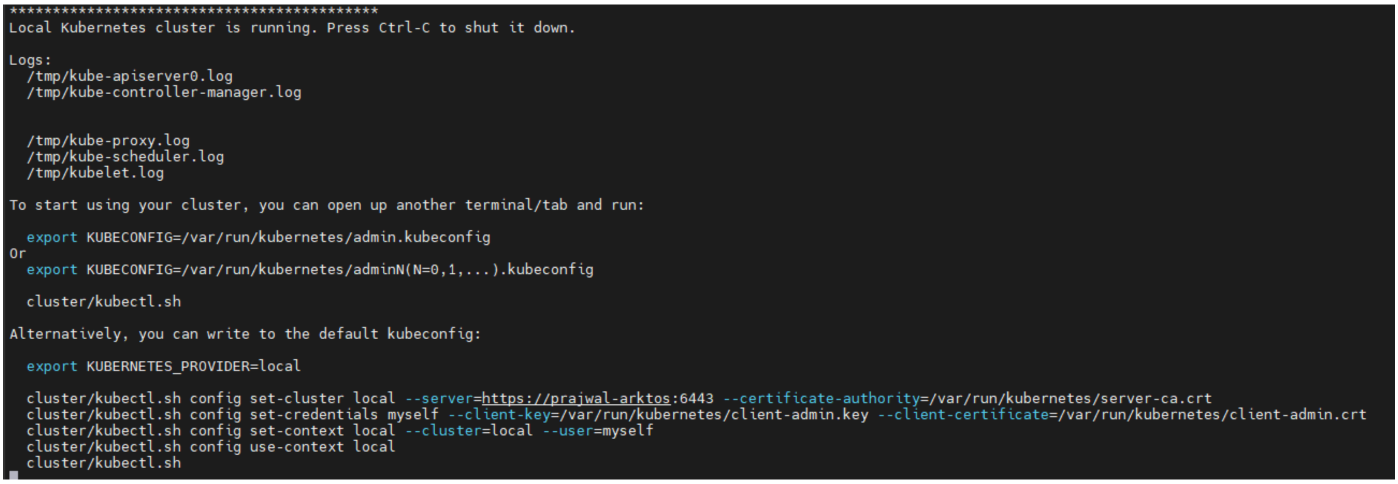

After restarting the containerd we got the output:

systemctl restart containerd



```
root@node-d:~/go/src/k8s.io/arktos# systemctl restart containerd
root@node-d:~/go/src/k8s.io/arktos# systemctl status containerd
● containerd.service - containerd container runtime
   Loaded: loaded (/lib/systemd/system/containerd.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2021-12-10 07:33:41 UTC; 9s ago
     Docs: https://containerd.io
  Process: 31699 ExecStartPre=/sbin/modprobe overlay (code=exited, status=0/SUCCESS)
 Main PID: 31706 (containerd)
    Tasks: 27
   CGroup: /system.slice/containerd.service
           └─31706 /usr/bin/containerd

Dec 10 07:33:49 node-d containerd[31706]: time="2021-12-10T07:33:49.621118864Z" level=info msg="No cni config template is specified, wait for other system compone
Dec 10 07:33:49 node-d containerd[31706]: time="2021-12-10T07:33:49.721994662Z" level=info msg="No cni config template is specified, wait for other system compone
Dec 10 07:33:49 node-d containerd[31706]: time="2021-12-10T07:33:49.822897670Z" level=info msg="No cni config template is specified, wait for other system compone
Dec 10 07:33:49 node-d containerd[31706]: time="2021-12-10T07:33:49.923930419Z" level=info msg="No cni config template is specified, wait for other system compone
Dec 10 07:33:50 node-d containerd[31706]: time="2021-12-10T07:33:50.024838447Z" level=info msg="No cni config template is specified, wait for other system compone
Dec 10 07:33:50 node-d containerd[31706]: time="2021-12-10T07:33:50.125881377Z" level=info msg="No cni config template is specified, wait for other system compone
Dec 10 07:33:50 node-d containerd[31706]: time="2021-12-10T07:33:50.227019115Z" level=info msg="No cni config template is specified, wait for other system compone
Dec 10 07:33:50 node-d containerd[31706]: time="2021-12-10T07:33:50.428371958Z" level=info msg="No cni config template is specified, wait for other system compone
Dec 10 07:33:50 node-d containerd[31706]: time="2021-12-10T07:33:50.529398482Z" level=info msg="No cni config template is specified, wait for other system compone
Dec 10 07:33:50 node-d containerd[31706]: time="2021-12-10T07:33:50.630468349Z" level=info msg="No cni config template is specified, wait for other system compone
root@node-d:~/go/src/k8s.io/arktos# systemctl status containerd
● containerd.service - containerd container runtime
   Loaded: loaded (/lib/systemd/system/containerd.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2021-12-10 07:33:41 UTC; 39s ago
     Docs: https://containerd.io
  Process: 31699 ExecStartPre=/sbin/modprobe overlay (code=exited, status=0/SUCCESS)
 Main PID: 31706 (containerd)
    Tasks: 75
   CGroup: /system.slice/containerd.service
           ├─  310 /usr/bin/containerd-shim-runc-v2 -namespace k8s.io -id 4c70725e1ab35bbfded5566e32c0c474651ac01c3dacc8b134ba8882ed86275b -address /run/container
           ├─  333 /pause
           ├─  565 /usr/bin/containerd-shim-runc-v2 -namespace k8s.io -id 71494a722b3f8fba4cd6243a6dfc65a38adbe744c9414662568dbc637f6089b0 -address /run/container
           ├─  587 /pause
```

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/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://prajwal-arktos: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
```

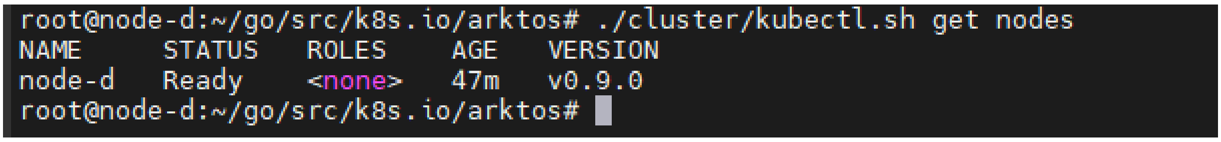
4. Leave the "arktos-up.sh" terminal and open another terminal to the master node.

Check nodes:

Command:

`./cluster/kubectl.sh get nodes`

Output:



```
root@node-d:~/go/src/k8s.io/arktos# ./cluster/kubectl.sh get nodes
NAME     STATUS   ROLES    AGE   VERSION
node-d   Ready    <none>   47m   v0.9.0
root@node-d:~/go/src/k8s.io/arktos#
```

Deploy test pods:

Command:

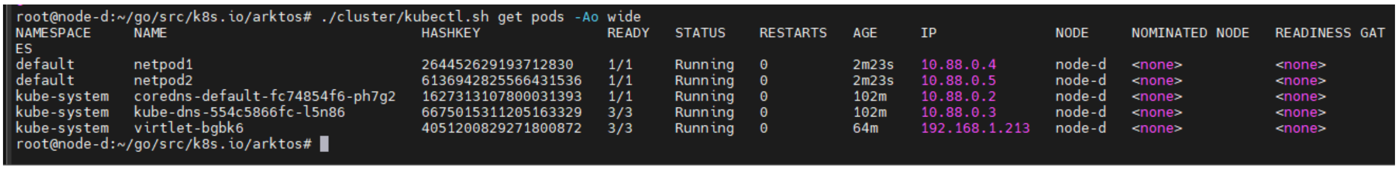
./cluster/kubectl.sh apply -f https://github.com/Click2Cloud-Centaurus/Documentation/blob/main/test-yamls/test_pods.yaml

Check deployed pods:

Command:

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

Output:



```
root@node-d:~/go/src/k8s.io/arktos# ./cluster/kubectl.sh get pods -Ao wide
NAMESPACE     NAME                              HASHKEY               READY   STATUS    RESTARTS   AGE     IP             NODE     NOMINATED NODE   READINESS GAT
ES
default       netpod1                           264452629193712830    1/1     Running   0          2m23s   10.88.0.4      node-d   <none>           <none>
default       netpod2                           6136942825566431536   1/1     Running   0          2m23s   10.88.0.5      node-d   <none>           <none>
kube-system   coredns-default-fc74854f6-ph7g2   1627313107800031393   1/1     Running   0          102m    10.88.0.2      node-d   <none>           <none>
kube-system   kube-dns-554c5866fc-l5n86         6675015311205163329   3/3     Running   0          102m    10.88.0.3      node-d   <none>           <none>
kube-system   virtlet-bgbk6                     4051200829271800872   3/3     Running   0          64m     192.168.1.213  node-d   <none>           <none>
root@node-d:~/go/src/k8s.io/arktos#
```

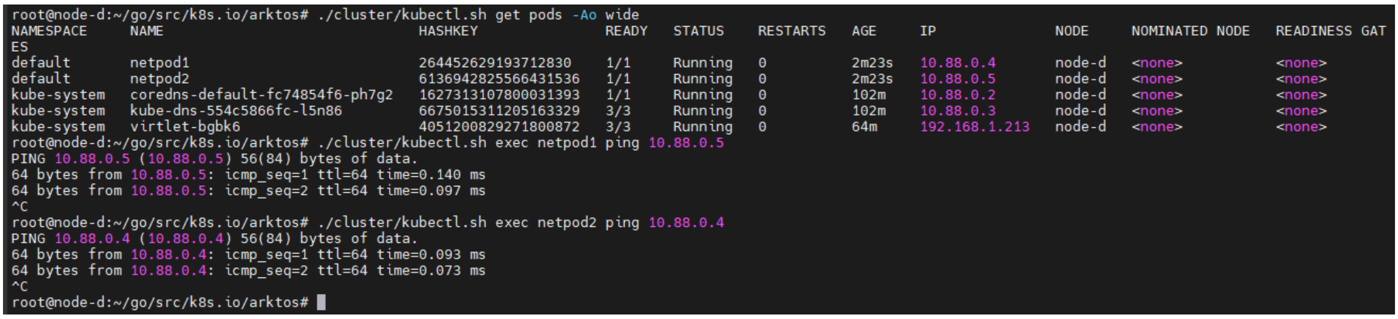
Check ping deployed pods:

Command:

./cluster/kubectl.sh exec netpod1 ping 10.88.0.5

./cluster/kubectl.sh exec netpod2 ping 10.88.0.4

Output:



```
root@node-d:~/go/src/k8s.io/arktos# ./cluster/kubectl.sh get pods -Ao wide
NAMESPACE     NAME                              HASHKEY               READY   STATUS    RESTARTS   AGE     IP              NODE     NOMINATED NODE   READINESS GAT
ES
default       netpod1                           2644526291937128300   1/1     Running   0          2m23s   10.88.0.4       node-d   <none>           <none>
default       netpod2                           6136942825566431536   1/1     Running   0          2m23s   10.88.0.5       node-d   <none>           <none>
kube-system   coredns-default-fc74854f6-ph7g2   1627313107800031393   1/1     Running   0          102m    10.88.0.2       node-d   <none>           <none>
kube-system   kube-dns-554c5866fc-l5n86         6675015311205163329   3/3     Running   0          102m    10.88.0.3       node-d   <none>           <none>
kube-system   virtlet-bgbk6                     4051200829271800872   3/3     Running   0          64m     192.168.1.213   node-d   <none>           <none>
root@node-d:~/go/src/k8s.io/arktos# ./cluster/kubectl.sh exec 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=0.140 ms
64 bytes from 10.88.0.5: icmp_seq=2 ttl=64 time=0.097 ms
^C
root@node-d:~/go/src/k8s.io/arktos# ./cluster/kubectl.sh exec 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=0.093 ms
64 bytes from 10.88.0.4: icmp_seq=2 ttl=64 time=0.073 ms
^C
root@node-d:~/go/src/k8s.io/arktos# 
```