Dashboard deployment :
Arktos without Mizar CNI (On Premise)

Date-15 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
Waiting for node ready at api server
Waiting for node ready at api server
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Waiting for node ready at api server
```

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 kubernetes dashboard:

Link for yaml file of dashboard:

https://click2cloud-my.sharepoint.com/:u:/g/personal/amit_nagpure_click2cloud_net/EdmJx0itP0RGl8WqAVVplbwBurpul2EhSi3_Ujd8xy7zQ

vi kubernetes-dashboard.yaml

copy the link yaml content to

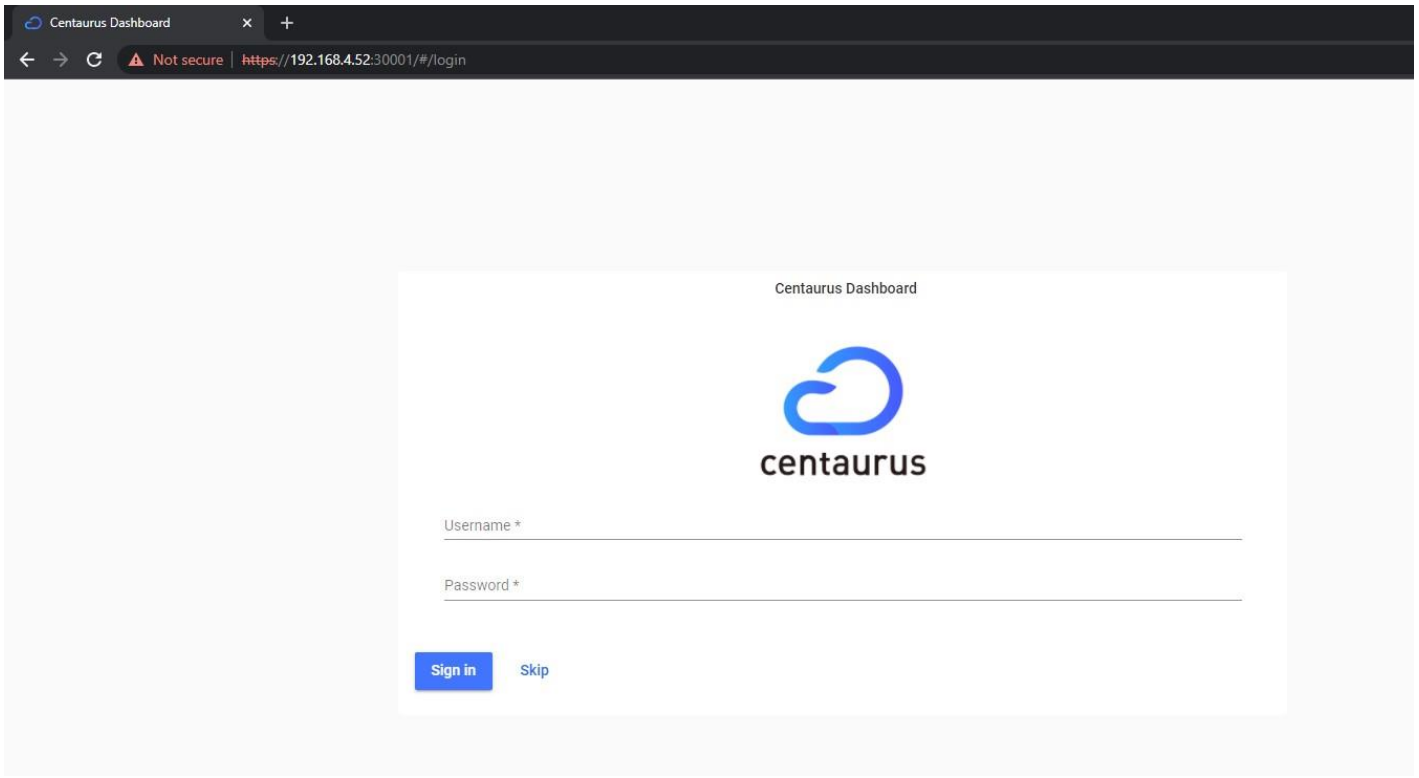
```
sudo sed -i '0,/RANDFILE/{s/RANDFILE/\#&/}' /etc/ssl/openssl.cnf
openssl genrsa -out dashboard.key 2048 openssl rsa -in
dashboard.key -out dashboard.key
openssl req -sha256 -new -key dashboard.key -out dashboard.csr -subj "/CN=$(hostname -I | awk '{print $1}')"
openssl x509 -req -sha256 -days 365 -in dashboard.csr -signkey dashboard.key -out dashboard.crt

kubectl create namespace kubernetes-dashboard

kubectl create secret generic kubernetes-dashboard-certs --from-file=$HOME/dashboard.key --
fromfile=$HOME/dashboard.crt -n kubernetes-dashboard

kubectl create -f kubernetes-dashboard.yaml
```

```
root@node-d:~/go/src/k8s.io/arktos# ./cluster/kubectl.sh create -f kubernetes-dashboard.yaml
serviceaccount/kubernetes-dashboard created
service/kubernetes-dashboard created
secret/kubernetes-dashboard-csrf created
secret/kubernetes-dashboard-key-holder created
configmap/kubernetes-dashboard-settings created
role.rbac.authorization.k8s.io/kubernetes-dashboard created
clusterrole.rbac.authorization.k8s.io/kubernetes-dashboard created
rolebinding.rbac.authorization.k8s.io/kubernetes-dashboard created
clusterrolebinding.rbac.authorization.k8s.io/kubernetes-dashboard created
deployment.apps/kubernetes-dashboard created
service/dashboard-metrics-scraper created
```

./cluster/kubectl get pods -Ao wide

```
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 GATES
kube-system            coredns-default-6ff7d98dc8-9r66m            3790096273370637885  1/1     Running   0          11m     10.88.0.3      node-d   <none>
  <none>
kube-system            kube-dns-554c5866fc-2rght                   3515277765848946229  3/3     Running   0          11m     10.88.0.2      node-d   <none>
  <none>
kube-system            virtlet-65pcv                               6213951806386579682  3/3     Running   0          7m30s   192.168.4.52   node-d   <none>
  <none>
kubernetes-dashboard   dashboard-metrics-scraper-6fbf748d6d-qrrwf  7726004176900680265  1/1     Running   0          67s     10.88.0.4      node-d   <none>
  <none>
kubernetes-dashboard   kubernetes-dashboard-5745876c85-6w6hn       6811219126517615809  1/1     Running   0          68s     10.88.0.5      node-d   <none>
  <none>
kubernetes-dashboard   kubernetes-dashboard-5745876c85-vm4xb       2942170762646836114  1/1     Running   0          67s     10.88.0.6      node-d   <none>
  <none>
```

The dashboard will expose on https:<ip>:30001



We need to set username and password for the dashboard

mkdir /etc/kubernetes/auth -p vi
/etc/kubernetes/auth/auth.csv

inside the auth.csv paste the following input

adminpass123,admin,admin,system:masters

Then go to file common.sh

vi ./hack/lib/common.sh

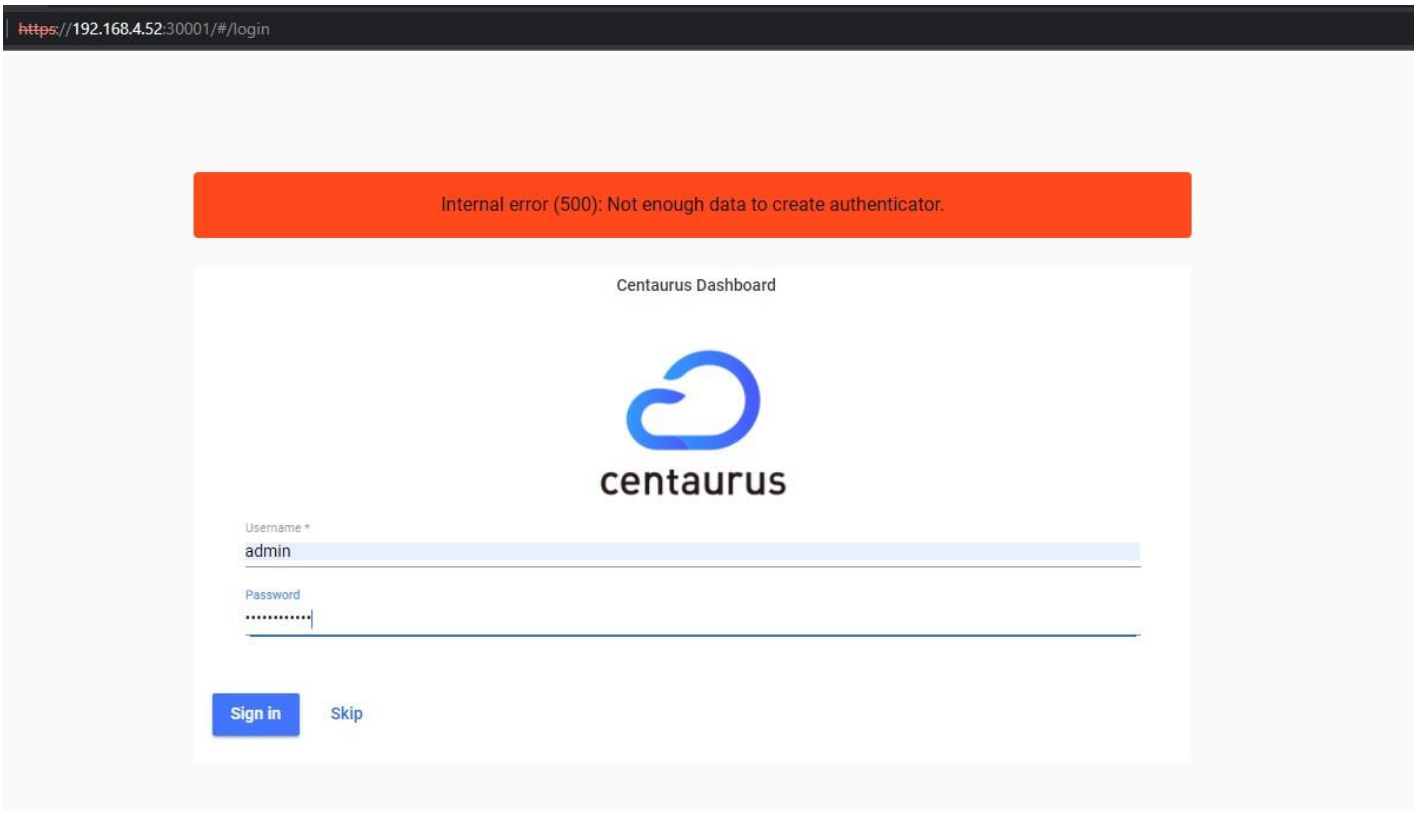
```
root@node-d:~/go/src/k8s.io/arktos# vi ./hack/lib/common.sh
```

after line.no 349 add the below entry

```
EOF
    AUDIT_POLICY_FILE="/tmp/kube-audit-policy-file$i"
  fi

  APISERVER_LOG=${LOG_DIR}/$apiserverlog
  ${CONTROLPLANE_SUDO} "${GO_OUT}/hyperkube" kube-apiserver "${authorizer_arg}" "${priv_arg}" ${runtime_config} \
    ${cloud_config_arg} \
    "${advertise_address}" \
    "${node_port_range}" \
    --v="${LOG_LEVEL}" \
    --vmodule="${LOG_SPEC}" \
    --audit-policy-file="${AUDIT_POLICY_FILE}" \
    --audit-log-path="${LOG_DIR}/$apiserverauditlog" \
    --basic-auth-file=/etc/kubernetes/auth/auth.csv
    --cert-dir="${CERT_DIR}" \
    --client-ca-file="${CERT_DIR}/client-ca.crt" \
    --kubelet-client-certificate="${CERT_DIR}/client-kube-apiserver.crt" \
    --kubelet-client-key="${CERT_DIR}/client-kube-apiserver.key" \
    --service-account-key-file="${SERVICE_ACCOUNT_KEY}" \
    --service-account-lookup="${SERVICE_ACCOUNT_LOOKUP}" \
    --enable-admission-plugins="${ENABLE_ADMISSION_PLUGINS}" \
    --disable-admission-plugins="${DISABLE_ADMISSION_PLUGINS}" \
    --admission-control-config-file="${ADMISSION_CONTROL_CONFIG_FILE}" \
-- INSERT --                                                                    350,7
```

- --basic-auth-file=/etc/kubernetes/auth/auth.csv

hit the dashboard link again and try to login



ERROR :

Internal error (500)