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

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.

Date-17 Dec. 2021

Step-1: Update kernel (If required)

To check kernel, run following command

uname -a

```
ubuntu@ip-172-31-35-226:~$ uname -a
Linux ip-172-31-35-226 5.4.0-1060-aws #63~18.04.1-Ubuntu SMP Mon Nov 15 14:31:31 UTC 2021 x86_64 x86_64 x86_64 GNU/Linux
```

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

```
Fetched 74.6 kB in 0s (217 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-35-226:/src/github.com/arktos$  sudo apt-get install ubuntu-make
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  python3-argcomplete python3-bs4 python3-gnupg python3-html5lib python3-lxml python3-progressbar python3-webencodings python3-xdg
Suggested packages:
  python3-genshi python3-lxml-dbg python-lxml-doc
The following NEW packages will be installed:
  python3-argcomplete python3-bs4 python3-gnupg python3-html5lib python3-lxml python3-progressbar python3-webencodings python3-xdg ubuntu-make
0 upgraded, 9 newly installed, 0 to remove and 13 not upgraded.
Need to get 1400 kB of archives.
After this operation, 5950 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/universe amd64 python3-argcomplete all 1.8.1-1ubuntu1 [26.9 kB]
Get:2 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 python3-bs4 all 4.6.0-1 [67.8 kB]
Get:3 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/universe amd64 python3-gnupg all 0.4.1-1ubuntu1.18.04.1 [17.1 kB]
Get:4 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 python3-webencodings all 0.5-2 [10.4 kB]
Get:5 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/main amd64 python3-html5lib all 0.999999999-1 [81.9 kB]
Get:6 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 python3-lxml amd64 4.2.1-1ubuntu0.4 [1097 kB]
Get:7 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/universe amd64 python3-progressbar all 2.3-4 [9630 B]
Get:8 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic-updates/main amd64 python3-xdg all 0.25-4ubuntu1.1 [31.3 kB]
Get:9 http://us-east-2.ec2.archive.ubuntu.com/ubuntu bionic/universe amd64 ubuntu-make all 16.11.1ubuntu1 [57.6 kB]
Fetched 1400 kB in 0s (8308 kB/s)
Selecting previously unselected package python3-argcomplete.
(Reading database ... 92801 files and directories currently installed.)
Preparing to unpack .../0-python3-argcomplete_1.8.1-1ubuntu1_all.deb ...
Unpacking python3-argcomplete (1.8.1-1ubuntu1) ...
Selecting previously unselected package python3-bs4.
Preparing to unpack .../1-python3-bs4_4.6.0-1_all.deb ...
Unpacking python3-bs4 (4.6.0-1) ...
Selecting previously unselected package python3-gnupg.
Preparing to unpack .../2-python3-gnupg_0.4.1-1ubuntu1.18.04.1_all.deb ...
Unpacking python3-gnupg (0.4.1-1ubuntu1.18.04.1) ...
Selecting previously unselected package python3-webencodings.
Preparing to unpack .../3-python3-webencodings_0.5-2_all.deb ...
Unpacking python3-webencodings (0.5-2) ...
Selecting previously unselected package python3-html5lib.
Preparing to unpack .../4-python3-html5lib_0.999999999-1_all.deb ...
Unpacking python3-html5lib (0.999999999-1) ...
Selecting previously unselected package python3-lxml:amd64.
Preparing to unpack .../5-python3-lxml_4.2.1-1ubuntu0.4_amd64.deb ...
Unpacking python3-lxml:amd64 (4.2.1-1ubuntu0.4) ...
Selecting previously unselected package python3-progressbar.
Preparing to unpack .../6-python3-progressbar_2.3-4_all.deb ...
Unpacking python3-progressbar (2.3-4) ...
Selecting previously unselected package python3-xdg.
Preparing to unpack .../7-python3-xdg_0.25-4ubuntu1.1_all.deb ...
Unpacking python3-xdg (0.25-4ubuntu1.1) ...
Selecting previously unselected package ubuntu-make.
Preparing to unpack .../8-ubuntu-make_16.11.1ubuntu1_all.deb ...
Unpacking ubuntu-make (16.11.1ubuntu1) ...
Setting up python3-webencodings (0.5-2) ...
Setting up python3-progressbar (2.3-4) ...
Setting up python3-lxml:amd64 (4.2.1-1ubuntu0.4) ...
Setting up python3-gnupg (0.4.1-1ubuntu1.18.04.1) ...
```

mkdir -p $GOPATH/src/github.com

cd $GOPATH/src/github.com

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

cd arktos

bash hack/setup-dev-node.sh

make

```
root@ip-172-31-35-226:/src/github.com/arktos# make
+++ [1217 07:35:57] Building go targets for linux/amd64:
    ./vendor/k8s.io/code-generator/cmd/deepcopy-gen
+++ [1217 07:36:05] Building go targets for linux/amd64:
    ./vendor/k8s.io/code-generator/cmd/defaulter-gen
+++ [1217 07:36:12] Building go targets for linux/amd64:
    ./vendor/k8s.io/code-generator/cmd/conversion-gen
+++ [1217 07:36:22] Building go targets for linux/amd64:
    ./vendor/k8s.io/kube-openapi/cmd/openapi-gen
+++ [1217 07:36:33] 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.
+++ [1217 07:36:44] 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
```

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

```
Arktos Setup done.
****************************************
Setup Kata Containers components ...
* Install Kata components
kata-containers 2.3.0 from Kata Containers (katacontainers✓) installed
* Checking Kata compatibility
time="2021-12-17T07:42:49Z" level=warning msg="Not running network checks as super user" arch=amd64 name=kata-runtime pid=4109 source=runtime time="2021-12-17T07:42:49Z" level=error msg="CPU property not found
rch=amd64 description="Virtualization support" name=vmx pid=4109 source=runtime type=flag time="2021-12-17T07:42:49Z" level=warning msg="modprobe insert module failed" arch=amd64 error="exit status 1" module=k
intel name=kata-runtime output="modprobe: ERROR: could not insert 'kvm_intel': Operation not supported\n" pid=4109 source=runtime time="2021-12-17T07:42:49Z" level=error msg="kernel property kvm_intel not foun
arch=amd64 description="Intel KVM" name=kvm_intel pid=4109 source=runtime type=module time="2021-12-17T07:42:49Z" level=error msg="ERROR: System is not capable of running Kata Containers" arch=amd64 name=kata-
time pid=4109 source=runtime ERROR: System is not capable of running Kata Containers
Aborted. Current system does not support Kata Containers.
Kata Setup done.
****************************************
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://ip-172-31-35-226:6443 --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

```
ubuntu@ip-172-31-35-226:/src/github.com/arktos$ ./cluster/kubectl.sh get nodes
NAME                STATUS   ROLES    AGE     VERSION
ip-172-31-35-226    Ready    <none>   3m30s   v0.9.0
```

2) Check pods status:

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

```
ubuntu@ip-172-31-35-226:/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-db947ddb8-x4vlc   559470266915271949   1/1     Running   0          3m31s  10.88.0.2      ip-172-31-35-226    <none>           <none>
kube-system   kube-dns-554c5866fc-h96z8         5242146391675538656  3/3     Running   0          3m31s  10.88.0.3      ip-172-31-35-226    <none>           <none>
kube-system   virtlet-824zm                     2722049154141057340  3/3     Running   0          3m32s  172.31.35.226  ip-172-31-35-226    <none>           <none>
```

Command:

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

Check deployed pods:

Command:

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

Output

```
ubuntu@ip-172-31-35-226:/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                           8087900749736038058  1/1     Running   0          64s   10.88.0.4      ip-172-31-35-226    <none>           <none>
default       netpod2                           6584546547910518947  1/1     Running   0          64s   10.88.0.5      ip-172-31-35-226    <none>           <none>
kube-system   coredns-default-db947ddb8-x4vlc   559470266915271949   1/1     Running   0          61m   10.88.0.2      ip-172-31-35-226    <none>           <none>
kube-system   kube-dns-554c5866fc-h96z8         5242146391675538656  3/3     Running   0          61m   10.88.0.3      ip-172-31-35-226    <none>           <none>
kube-system   virtlet-824zm                     2722049154141057340  3/3     Running   0          61m   172.31.35.226  ip-172-31-35-226    <none>           <none>
```

Check ping deployed pods:

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

```
ubuntu@ip-172-31-35-226:/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=0.106 ms
64 bytes from 10.88.0.5: icmp_seq=2 ttl=64 time=0.087 ms
64 bytes from 10.88.0.5: icmp_seq=3 ttl=64 time=0.075 ms
64 bytes from 10.88.0.5: icmp_seq=4 ttl=64 time=0.088 ms
64 bytes from 10.88.0.5: icmp_seq=5 ttl=64 time=0.076 ms
64 bytes from 10.88.0.5: icmp_seq=6 ttl=64 time=0.072 ms
^C
```

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

```
ubuntu@ip-172-31-35-226:/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=0.080 ms
64 bytes from 10.88.0.4: icmp_seq=2 ttl=64 time=0.077 ms
64 bytes from 10.88.0.4: icmp_seq=3 ttl=64 time=0.079 ms
64 bytes from 10.88.0.4: icmp_seq=4 ttl=64 time=0.094 ms
64 bytes from 10.88.0.4: icmp_seq=5 ttl=64 time=0.068 ms
^C
```