

## Clusters: kubectl get nodes

```
student@ds-student7:~/NTHU-K8S/setup$ kind create cluster --config kind-config.yaml
Creating cluster "kind" ...
  ✓ Ensuring node image (kindest/node:v1.29.2)
  ✓ Preparing nodes
  ✓ Writing configuration
  ✓ Starting control-plane
  ✓ Installing CNI
  ✓ Installing StorageClass
  ✓ Joining worker nodes
Set kubectl context to "kind-kind"
You can now use your cluster with:

kubectl cluster-info --context kind-kind

Thanks for using kind!

student@ds-student7:~/NTHU-K8S/setup$ cd ../
student@ds-student7:~/NTHU-K8S$ cd ~
student@ds-student7:~$ docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                    NAMES
b43f1eb083a3   kindest/node:v1.29.2   "/usr/local/bin/entr..."   About a minute ago   Up About a minute   127.0.0.1:33389->6443/tcp   kind-worker
9ed22d8df32b   kindest/node:v1.29.2   "/usr/local/bin/entr..."   About a minute ago   Up About a minute                        kind-control-plane
8bc3de1aa863   kindest/node:v1.29.2   "/usr/local/bin/entr..."   About a minute ago   Up About a minute                        kind-worker2

student@ds-student7:~$ kubectl get nodes
NAME                STATUS    ROLES    AGE   VERSION
kind-control-plane   Ready     control-plane   66s   v1.29.2
kind-worker          Ready     <none>        41s   v1.29.2
kind-worker2         Ready     <none>        41s   v1.29.2
```

## Unit test results:

```
root@cb9d0c11618b:/go/src/app# go test -v ./...
?      my-scheduler-plugins/cmd/scheduler      [no test files]
=== RUN   TestCustomScheduler_PreFilter
=== RUN   TestCustomScheduler_PreFilter/pod_is_accepted
finish adding2024/06/15 10:11:52 Pod  is in Prefilter phase.
=== RUN   TestCustomScheduler_PreFilter/pod_is_just_accepted
finish adding2024/06/15 10:11:52 Pod  is in Prefilter phase.
=== RUN   TestCustomScheduler_PreFilter/pod_is_rejected
finish adding2024/06/15 10:11:52 Pod  is in Prefilter phase.
--- PASS: TestCustomScheduler_PreFilter (0.00s)
    --- PASS: TestCustomScheduler_PreFilter/pod_is_accepted (0.00s)
    --- PASS: TestCustomScheduler_PreFilter/pod_is_just_accepted (0.00s)
    --- PASS: TestCustomScheduler_PreFilter/pod_is_rejected (0.00s)
=== RUN   TestCustomScheduler_Score
=== RUN   TestCustomScheduler_Score/least_mode
2024/06/15 10:11:52 Custom scheduler runs with the mode: Least.
2024/06/15 10:11:52 Pod  is in Score phase. Calculate the score of Node m1.
2024/06/15 10:11:52 Pod  is in Score phase. Calculate the score of Node m2.
=== RUN   TestCustomScheduler_Score/most_mode
2024/06/15 10:11:52 Custom scheduler runs with the mode: Least.
2024/06/15 10:11:52 Pod  is in Score phase. Calculate the score of Node m1.
2024/06/15 10:11:52 Pod  is in Score phase. Calculate the score of Node m2.
--- PASS: TestCustomScheduler_Score (0.00s)
    --- PASS: TestCustomScheduler_Score/least_mode (0.00s)
    --- PASS: TestCustomScheduler_Score/most_mode (0.00s)
=== RUN   TestCustomScheduler_NormalizeScore
=== RUN   TestCustomScheduler_NormalizeScore/scores_in_range
=== RUN   TestCustomScheduler_NormalizeScore/scores_out_of_range
=== RUN   TestCustomScheduler_NormalizeScore/negative_score
--- PASS: TestCustomScheduler_NormalizeScore (0.00s)
    --- PASS: TestCustomScheduler_NormalizeScore/scores_in_range (0.00s)
    --- PASS: TestCustomScheduler_NormalizeScore/scores_out_of_range (0.00s)
    --- PASS: TestCustomScheduler_NormalizeScore/negative_score (0.00s)
PASS
ok      my-scheduler-plugins/pkg/plugins      0.032s
```

## Deployment:

```
student@ds-student7:~/NTHU-Scheduler-Plugin-main$ make buildLocal
docker build . -t my-scheduler:local
[+] Building 84.6s (13/13) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 268B
=> [internal] load metadata for docker.io/library/alpine:latest
=> [internal] load metadata for docker.io/library/golang:1.20
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [stage-0 1/4] FROM docker.io/library/golang:1.20@sha256:8f9af7094d0cb27cc783c697ac5ba25efdc4da35f8526db21f7aebb0b0b4f18a
=> CACHED [stage-1 1/3] FROM docker.io/library/alpine:latest@sha256:77726ef6b57ddf65bb551896826ec38bc3e53f75cdde31354fbfb4f25238ebd
=> [internal] load build context
=> => transferring context: 78.95MB
=> CACHED [stage-0 2/4] WORKDIR /go/src/sigs.k8s.io/scheduler-plugins
=> [stage-0 3/4] COPY . .
=> [stage-0 4/4] RUN make build
=> [stage-1 2/3] COPY --from=0 /go/src/sigs.k8s.io/scheduler-plugins/bin/my-scheduler /bin/kube-scheduler
=> [stage-1 3/3] WORKDIR /bin
=> exporting to image
=> => exporting layers
=> => writing image sha256:e88e3331bf827831a1d88b473a6cf2eb423de609809d82e241a8e1018b7034dd
=> => naming to docker.io/library/my-scheduler:local

student@ds-student7:~/NTHU-Scheduler-Plugin-main$ make loadImage
kind load docker-image my-scheduler:local
Image: "my-scheduler:local" with ID "sha256:e88e3331bf827831a1d88b473a6cf2eb423de609809d82e241a8e1018b7034dd" not yet present on node "kind-worker", loading...
Image: "my-scheduler:local" with ID "sha256:e88e3331bf827831a1d88b473a6cf2eb423de609809d82e241a8e1018b7034dd" not yet present on node "kind-control-plane", loading...
Image: "my-scheduler:local" with ID "sha256:e88e3331bf827831a1d88b473a6cf2eb423de609809d82e241a8e1018b7034dd" not yet present on node "kind-worker2", loading...
student@ds-student7:~/NTHU-Scheduler-Plugin-main$
```

Scenario 1: Pod number < minAvailable: Set 1 pod only and run the scheduler, it should be filtered by prefilter() since the pod number = 1 < minAvailable = 2. The status shows that nginx is pending indicates that nginx is filtered by prefilter()

```
student@ds-student7:~/NTHU-Scheduler-Plugin-main$ kubectl create -f pod-scenario1.yaml
pod/nginx created
student@ds-student7:~/NTHU-Scheduler-Plugin-main$ kubectl get po -o wide
NAME                                READY   STATUS    RESTARTS   AGE   IP            NODE           NOMINATED NODE   READINESS GATES
my-scheduler-69cfc986c7-845x1      1/1     Running   0           23s   10.244.2.10   kind-worker2   <none>           <none>
nginx                               0/1     Pending   0           8s    <none>        <none>         <none>           <none>
```

## Logs of prefilter():

```
● student@ds-student7:~/NTHU-Scheduler-Plugin-main$ kubectl logs my-scheduler-69cfc986c7-845x1
2024/06/15 15:17:50 custom-scheduler starts!
I0615 15:17:50.382154      1 flags.go:64] FLAG: --allow-metric-labels="[]"
I0615 15:17:50.382182      1 flags.go:64] FLAG: --authentication-kubeconfig=""
I0615 15:17:50.382189      1 flags.go:64] FLAG: --authentication-skip-lookup="false"
I0615 15:17:50.382195      1 flags.go:64] FLAG: --authentication-token-webhook-cache-ttl="10s"
I0615 15:17:50.382201      1 flags.go:64] FLAG: --authentication-tolerate-lookup-failure="true"
I0615 15:17:50.382205      1 flags.go:64] FLAG: --authorization-always-allow-paths="[/healthz,/readyz,/livez]"
I0615 15:17:50.382232      1 flags.go:64] FLAG: --authorization-kubeconfig=""
I0615 15:17:50.382237      1 flags.go:64] FLAG: --authorization-webhook-cache-authorized-ttl="10s"
I0615 15:17:50.382241      1 flags.go:64] FLAG: --authorization-webhook-cache-unauthorized-ttl="10s"
I0615 15:17:50.382257      1 flags.go:64] FLAG: --bind-address="0.0.0.0"
I0615 15:17:50.382270      1 flags.go:64] FLAG: --cert-dir=""
I0615 15:17:50.382274      1 flags.go:64] FLAG: --client-ca-file=""
I0615 15:17:50.382277      1 flags.go:64] FLAG: --config="/etc/kubernetes/scheduler-config.yaml"
I0615 15:17:50.382282      1 flags.go:64] FLAG: --contention-profiling="true"
I0615 15:17:50.382286      1 flags.go:64] FLAG: --disabled-metrics="[]"
I0615 15:17:50.382292      1 flags.go:64] FLAG: --feature-gates=""
I0615 15:17:50.382302      1 flags.go:64] FLAG: --help="false"
I0615 15:17:50.382307      1 flags.go:64] FLAG: --http2-max-streams-per-connection="0"
I0615 15:17:50.382312      1 flags.go:64] FLAG: --kube-api-burst="100"
I0615 15:17:50.382318      1 flags.go:64] FLAG: --kube-api-content-type="application/vnd.kubernetes.protobuf"
I0615 15:17:50.382322      1 flags.go:64] FLAG: --kube-api-qps="50"
I0615 15:17:50.382330      1 flags.go:64] FLAG: --kubeconfig=""
I0615 15:17:50.382334      1 flags.go:64] FLAG: --leader-elect="true"
I0615 15:17:50.382338      1 flags.go:64] FLAG: --leader-elect-lease-duration="15s"
I0615 15:17:50.382342      1 flags.go:64] FLAG: --leader-elect-renew-deadline="10s"
I0615 15:17:50.382346      1 flags.go:64] FLAG: --leader-elect-resource-lock="leases"
I0615 15:17:50.382353      1 flags.go:64] FLAG: --leader-elect-resource-name="kube-scheduler"
I0615 15:17:50.382372      1 flags.go:64] FLAG: --leader-elect-resource-namespace="kube-system"
I0615 15:17:50.382383      1 flags.go:64] FLAG: --leader-elect-retry-period="2s"
I0615 15:17:50.382388      1 flags.go:64] FLAG: --lock-object-name="kube-scheduler"
I0615 15:17:50.382392      1 flags.go:64] FLAG: --lock-object-namespace="kube-system"
I0615 15:17:50.382396      1 flags.go:64] FLAG: --log-flush-frequency="5s"
I0615 15:17:50.382400      1 flags.go:64] FLAG: --logging-format="text"
I0615 15:17:50.382404      1 flags.go:64] FLAG: --master=""
I0615 15:17:50.382408      1 flags.go:64] FLAG: --permit-address-sharing="false"
I0615 15:17:50.382411      1 flags.go:64] FLAG: --permit-port-sharing="false"
I0615 15:17:50.382415      1 flags.go:64] FLAG: --pod-max-in-unschedulable-pods-duration="5m0s"
I0615 15:17:50.382423      1 flags.go:64] FLAG: --profiling="true"
I0615 15:17:50.382427      1 flags.go:64] FLAG: --requestheader-allowed-names="[]"
I0615 15:17:50.382436      1 flags.go:64] FLAG: --requestheader-client-ca-file=""
I0615 15:17:50.382439      1 flags.go:64] FLAG: --requestheader-extra-headers-prefix="[x-remote-extra-]"
I0615 15:17:50.382459      1 flags.go:64] FLAG: --requestheader-group-headers="[x-remote-group]"
I0615 15:17:50.382467      1 flags.go:64] FLAG: --requestheader-username-headers="[x-remote-user]"
I0615 15:17:50.382472      1 flags.go:64] FLAG: --secure-port="10259"
I0615 15:17:50.382480      1 flags.go:64] FLAG: --show-hidden-metrics-for-version=""
I0615 15:17:50.382484      1 flags.go:64] FLAG: --tls-cert-file=""
I0615 15:17:50.382488      1 flags.go:64] FLAG: --tls-cipher-suites="[]"
I0615 15:17:50.382497      1 flags.go:64] FLAG: --tls-min-version=""
I0615 15:17:50.382502      1 flags.go:64] FLAG: --tls-private-key-file=""
I0615 15:17:50.382506      1 flags.go:64] FLAG: --tls-sni-cert-key="[]"

I0615 15:18:04.402050      1 log.go:194] Pod nginx is in Prefilter phase.
I0615 15:18:04.403542      1 schedule_one.go:867] "Unable to schedule pod; no fit; waiting" pod="default/nginx" err="W/3 nodes are available: pod in group is less than minAvailable number . preemption: 0/3 nodes are available: 3 No preemption victims found for incoming pod."
```

## Scenario 2: Least mode:

Set additional 2 pods(nginx2 and nginx3) so that the total pod number reaches minAvailable. The pods utilize kind-worker which has the least allocatable memory.

```
Name: kind-worker
Roles: <none>
Labels: beta.kubernetes.io/arch=amd64
        beta.kubernetes.io/os=linux
        kubernetes.io/arch=amd64
        kubernetes.io/hostname=kind-worker
        kubernetes.io/os=linux
Annotations: kubeadm.alpha.kubernetes.io/cri-socket: unix:///run/containerd/containerd.sock
              node.alpha.kubernetes.io/ttl: 0
              volumes.kubernetes.io/controller-managed-attach-detach: true
CreationTimestamp: Sat, 15 Jun 2024 09:52:39 +0000
Taints: <none>
Unschedulable: false
Lease:
  HolderIdentity: kind-worker
  AcquireTime: <unset>
  RenewTime: Sat, 15 Jun 2024 10:41:36 +0000
Conditions:
  Type           Status  LastHeartbeatTime           LastTransitionTime          Reason                        Message
  ----           -
  MemoryPressure False   Sat, 15 Jun 2024 10:41:06 +0000 Sat, 15 Jun 2024 09:52:39 +0000 KubeletHasSufficientMemory kubelet has sufficient memory available
  DiskPressure   False   Sat, 15 Jun 2024 10:41:06 +0000 Sat, 15 Jun 2024 09:52:39 +0000 KubeletHasNoDiskPressure  kubelet has no disk pressure
  PIDPressure    False   Sat, 15 Jun 2024 10:41:06 +0000 Sat, 15 Jun 2024 09:52:39 +0000 KubeletHasSufficientPID   kubelet has sufficient PID available
  Ready          True    Sat, 15 Jun 2024 10:41:06 +0000 Sat, 15 Jun 2024 09:52:42 +0000 KubeletReady              kubelet is posting ready status
Addresses:
  InternalIP: 172.19.0.4
  Hostname: kind-worker
Capacity:
  CPU: 6
  ephemeral-storage: 50620216Ki
  hugepages-2Mi: 0
  memory: 6063024Ki
  pods: 110
Allocatable:
  CPU: 6
  ephemeral-storage: 50620216Ki
  hugepages-2Mi: 0
  memory: 1344432Ki
  pods: 110
System Info:
  Machine ID: f11d7005dccc3499a8871984a19312375
  System UUID: 817196f5-a983-498a-a2cb-d77c1d5fe499
  Boot ID: 45c345c4-90e1-46bf-956b-2bba210c7b60
  Kernel Version: 5.15.0-112-generic
  OS Image: Debian GNU/Linux 12 (bookworm)
  Operating System: linux
  Architecture: amd64
  Container Runtime Version: containerd://1.7.13
  Kubelet Version: v1.29.2
  Kube-Proxy Version: v1.29.2
```

```
student@ds-student7:~/NTHU-Scheduler-Plugin-main$ kubectl get po -o wide
NAME                                READY   STATUS    RESTARTS   AGE   IP            NODE           NOMINATED NODE   READINESS GATES
my-scheduler-69cfc986c7-kpsqj      1/1     Running   0           11m   10.244.2.2    kind-worker2    <none>            <none>
nginx                                1/1     Running   0           8m24s  10.244.1.2    kind-worker     <none>            <none>
nginx2                              1/1     Running   0           10s    10.244.1.4    kind-worker     <none>            <none>
nginx3                              1/1     Running   0           83s    10.244.1.3    kind-worker     <none>            <none>
```

## Logs for least mode

```
● student@ds-student7:~/NTHU-Scheduler-Plugin-main$ kubectl logs my-scheduler-69cfc986c7-kpsqj
2024/06/15 10:21:54 custom-scheduler starts!
I0615 10:21:54.042915      1 flags.go:64] FLAG: --allow-metric-labels="[]"
I0615 10:21:54.042937      1 flags.go:64] FLAG: --authentication-kubeconfig=""
I0615 10:21:54.042943      1 flags.go:64] FLAG: --authentication-skip-lookup="false"
I0615 10:21:54.042947      1 flags.go:64] FLAG: --authentication-token-webhook-cache-ttl="10s"
I0615 10:21:54.042952      1 flags.go:64] FLAG: --authentication-tolerate-lookup-failure="true"
I0615 10:21:54.042957      1 flags.go:64] FLAG: --authorization-always-allow-paths="/healthz,/readyz,/livez"
I0615 10:21:54.042965      1 flags.go:64] FLAG: --authorization-kubeconfig=""
I0615 10:21:54.042968      1 flags.go:64] FLAG: --authorization-webhook-cache-authorized-ttl="10s"
I0615 10:21:54.042978      1 flags.go:64] FLAG: --authorization-webhook-cache-unauthorized-ttl="10s"
I0615 10:21:54.042981      1 flags.go:64] FLAG: --bind-address="0.0.0.0"
I0615 10:21:54.042985      1 flags.go:64] FLAG: --cert-dir=""
I0615 10:21:54.042990      1 flags.go:64] FLAG: --client-ca-file=""
I0615 10:21:54.042993      1 flags.go:64] FLAG: --config="/etc/kubernetes/scheduler-config.yaml"
I0615 10:21:54.043003      1 flags.go:64] FLAG: --contention-profiling="true"
I0615 10:21:54.043005      1 flags.go:64] FLAG: --disabled-metrics="[]"
I0615 10:21:54.043015      1 flags.go:64] FLAG: --feature-gates=""
I0615 10:21:54.043020      1 flags.go:64] FLAG: --help="false"
I0615 10:21:54.043023      1 flags.go:64] FLAG: --http2-max-streams-per-connection="0"
I0615 10:21:54.043030      1 flags.go:64] FLAG: --kube-api-burst="100"
I0615 10:21:54.043036      1 flags.go:64] FLAG: --kube-api-content-type="application/vnd.kubernetes.protobuf"
I0615 10:21:54.043040      1 flags.go:64] FLAG: --kube-api-qps="50"
I0615 10:21:54.043048      1 flags.go:64] FLAG: --kubeconfig=""
I0615 10:21:54.043051      1 flags.go:64] FLAG: --leader-elect="true"
I0615 10:21:54.043053      1 flags.go:64] FLAG: --leader-elect-lease-duration="15s"
I0615 10:21:54.043056      1 flags.go:64] FLAG: --leader-elect-renew-deadline="10s"
I0615 10:21:54.043059      1 flags.go:64] FLAG: --leader-elect-resource-lock="leases"
I0615 10:21:54.043062      1 flags.go:64] FLAG: --leader-elect-resource-name="kube-scheduler"
I0615 10:21:54.043065      1 flags.go:64] FLAG: --leader-elect-resource-namespace="kube-system"
I0615 10:21:54.043068      1 flags.go:64] FLAG: --leader-elect-retry-period="2s"
I0615 10:21:54.043077      1 flags.go:64] FLAG: --lock-object-name="kube-scheduler"
I0615 10:21:54.043085      1 flags.go:64] FLAG: --lock-object-namespace="kube-system"
I0615 10:21:54.043088      1 flags.go:64] FLAG: --log-flush-frequency="5s"
I0615 10:21:54.043091      1 flags.go:64] FLAG: --logging-format="text"
I0615 10:21:54.043093      1 flags.go:64] FLAG: --master=""
I0615 10:21:54.043096      1 flags.go:64] FLAG: --permit-address-sharing="false"
I0615 10:21:54.043099      1 flags.go:64] FLAG: --permit-port-sharing="false"
I0615 10:21:54.043102      1 flags.go:64] FLAG: --pod-max-in-unschedulable-pods-duration="5m0s"
I0615 10:21:54.043105      1 flags.go:64] FLAG: --profiling="true"
I0615 10:21:54.043108      1 flags.go:64] FLAG: --requestheader-allowed-names="[]"
I0615 10:21:54.043117      1 flags.go:64] FLAG: --requestheader-client-ca-file=""
I0615 10:21:54.043119      1 flags.go:64] FLAG: --requestheader-extra-headers-prefix="[x-remote-extra-]"
I0615 10:21:54.043129      1 flags.go:64] FLAG: --requestheader-group-headers="[x-remote-group]"
I0615 10:21:54.043134      1 flags.go:64] FLAG: --requestheader-username-headers="[x-remote-user]"
I0615 10:21:54.043141      1 flags.go:64] FLAG: --secure-port="10259"
I0615 10:21:54.043144      1 flags.go:64] FLAG: --show-hidden-metrics-for-version=""
I0615 10:21:54.043147      1 flags.go:64] FLAG: --tls-cert-file=""
I0615 10:21:54.043151      1 flags.go:64] FLAG: --tls-cipher-suites="[]"
I0615 10:21:54.043163      1 flags.go:64] FLAG: --tls-min-version=""

I0615 10:25:03.070774      1 log.go:194] Pod nginx is in Prefilter phase.
I0615 10:25:03.072330      1 log.go:194] Pod nginx is in Score phase. Calculate the score of Node kind-worker.
I0615 10:25:03.072369      1 log.go:194] Pod nginx is in Score phase. Calculate the score of Node kind-worker2.
I0615 10:25:03.084367      1 schedule_one.go:252] "Successfully bound pod to node" pod="default/nginx" node="kind-worker" evaluatedNodes=3 feasibleNodes=2
I0615 10:32:04.114217      1 log.go:194] Pod nginx3 is in Prefilter phase.
I0615 10:32:04.115100      1 log.go:194] Pod nginx3 is in Score phase. Calculate the score of Node kind-worker.
I0615 10:32:04.115127      1 log.go:194] Pod nginx3 is in Score phase. Calculate the score of Node kind-worker2.
I0615 10:32:04.122466      1 schedule_one.go:252] "Successfully bound pod to node" pod="default/nginx3" node="kind-worker" evaluatedNodes=3 feasibleNodes=2
I0615 10:33:17.902342      1 log.go:194] Pod nginx2 is in Prefilter phase.
I0615 10:33:17.903395      1 log.go:194] Pod nginx2 is in Score phase. Calculate the score of Node kind-worker.
I0615 10:33:17.903429      1 log.go:194] Pod nginx2 is in Score phase. Calculate the score of Node kind-worker2.
I0615 10:33:17.911490      1 schedule_one.go:252] "Successfully bound pod to node" pod="default/nginx2" node="kind-worker" evaluatedNodes=3 feasibleNodes=2
```

### Scenario 3: Most mode:

Remove the deployment, change the mode at chart/values.yaml to Most. After redeploying the scheduler, the pods showed that kind-worker2, which has most allocatable memory, is utilized.

```
Name: kind-worker2
Roles: <none>
Labels: beta.kubernetes.io/arch=amd64
        beta.kubernetes.io/os=linux
        kubernetes.io/arch=amd64
        kubernetes.io/hostname=kind-worker2
        kubernetes.io/os=linux
Annotations: kubeadm.alpha.kubernetes.io/cri-socket: unix:///run/containerd/containerd.sock
              node.alpha.kubernetes.io/ttl: 0
              volumes.kubernetes.io/controller-managed-attach-detach: true
CreationTimestamp: Sat, 15 Jun 2024 09:52:39 +0000
Taints: <none>
Unschedulable: false
Lease:
  HolderIdentity: kind-worker2
  AcquireTime: <unset>
  RenewTime: Sat, 15 Jun 2024 10:57:26 +0000
Conditions:
  Type           Status  LastHeartbeatTime           LastTransitionTime          Reason                        Message
  ----           -
MemoryPressure   False   Sat, 15 Jun 2024 10:54:43 +0000   Sat, 15 Jun 2024 09:52:39 +0000   KubeletHasSufficientMemory   kubelet has sufficient memory available
DiskPressure     False   Sat, 15 Jun 2024 10:54:43 +0000   Sat, 15 Jun 2024 09:52:39 +0000   KubeletHasNoDiskPressure     kubelet has no disk pressure
PIDPressure      False   Sat, 15 Jun 2024 10:54:43 +0000   Sat, 15 Jun 2024 09:52:39 +0000   KubeletHasSufficientPID      kubelet has sufficient PID available
Ready           True    Sat, 15 Jun 2024 10:54:43 +0000   Sat, 15 Jun 2024 09:52:44 +0000   KubeletReady                 kubelet is posting ready status
Addresses:
  InternalIP: 172.19.0.3
  Hostname: kind-worker2
Capacity:
  cpu: 6
  ephemeral-storage: 50620216Ki
  hugepages-2Mi: 0
  memory: 6063024Ki
  pods: 110
Allocatable:
  cpu: 6
  ephemeral-storage: 50620216Ki
  hugepages-2Mi: 0
  memory: 1068720Ki
  pods: 110
System Info:
  Machine ID: 599b7ecffd5c441cb4c5938f4624f94d
  System UUID: 04e55afa-2d8e-4cb9-a2c1-fd276aa1d3bd
  Boot ID: 45c345c4-00e1-46bf-956b-2bba218c7b60
  Kernel Version: 5.15.0-112-generic
  OS Image: Debian GNU/Linux 12 (bookworm)
  Operating System: linux
  Architecture: amd64
  Container Runtime Version: containerd://1.7.13
  Kubelet Version: v1.29.2
  Kube-Proxy Version: v1.29.2
```



## Logs for most mode

```
● student@ds-student7:~/NTHU-Scheduler-Plugin-main$ kubectl logs my-scheduler-69cfc986c7-nhb7w
2024/06/15 10:52:15 custom-scheduler starts!
I0615 10:52:15.558411 1 flags.go:64] FLAG: --allow-metric-labels="[]"
I0615 10:52:15.558447 1 flags.go:64] FLAG: --authentication-kubeconfig=""
I0615 10:52:15.558454 1 flags.go:64] FLAG: --authentication-skip-lookup="false"
I0615 10:52:15.558460 1 flags.go:64] FLAG: --authentication-token-webhook-cache-ttl="10s"
I0615 10:52:15.558467 1 flags.go:64] FLAG: --authentication-tolerate-lookup-failure="true"
I0615 10:52:15.558472 1 flags.go:64] FLAG: --authorization-always-allow-paths="[/healthz,/readyz,/livez]"
I0615 10:52:15.558483 1 flags.go:64] FLAG: --authorization-kubeconfig=""
I0615 10:52:15.558486 1 flags.go:64] FLAG: --authorization-webhook-cache-authorized-ttl="10s"
I0615 10:52:15.558490 1 flags.go:64] FLAG: --authorization-webhook-cache-unauthorized-ttl="10s"
I0615 10:52:15.558494 1 flags.go:64] FLAG: --bind-address="0.0.0.0"
I0615 10:52:15.558502 1 flags.go:64] FLAG: --cert-dir=""
I0615 10:52:15.558505 1 flags.go:64] FLAG: --client-ca-file=""
I0615 10:52:15.558510 1 flags.go:64] FLAG: --config="/etc/kubernetes/scheduler-config.yaml"
I0615 10:52:15.558514 1 flags.go:64] FLAG: --contention-profiling="true"
I0615 10:52:15.558522 1 flags.go:64] FLAG: --disabled-metrics="[]"
I0615 10:52:15.558529 1 flags.go:64] FLAG: --feature-gates=""
I0615 10:52:15.558536 1 flags.go:64] FLAG: --help="false"
I0615 10:52:15.558543 1 flags.go:64] FLAG: --http2-max-streams-per-connection="0"
I0615 10:52:15.558548 1 flags.go:64] FLAG: --kube-api-burst="100"
I0615 10:52:15.558553 1 flags.go:64] FLAG: --kube-api-content-type="application/vnd.kubernetes.protobuf"
I0615 10:52:15.558557 1 flags.go:64] FLAG: --kube-api-qps="50"
I0615 10:52:15.558563 1 flags.go:64] FLAG: --kubeconfig=""
I0615 10:52:15.558566 1 flags.go:64] FLAG: --leader-elect="true"
I0615 10:52:15.558572 1 flags.go:64] FLAG: --leader-elect-lease-duration="15s"
I0615 10:52:15.558577 1 flags.go:64] FLAG: --leader-elect-renew-deadline="10s"
I0615 10:52:15.558580 1 flags.go:64] FLAG: --leader-elect-resource-lock="leases"
I0615 10:52:15.558584 1 flags.go:64] FLAG: --leader-elect-resource-name="kube-scheduler"
I0615 10:52:15.558587 1 flags.go:64] FLAG: --leader-elect-resource-namespace="kube-system"
I0615 10:52:15.558590 1 flags.go:64] FLAG: --leader-elect-retry-period="2s"
I0615 10:52:15.558592 1 flags.go:64] FLAG: --lock-object-name="kube-scheduler"
I0615 10:52:15.558595 1 flags.go:64] FLAG: --lock-object-namespace="kube-system"
I0615 10:52:15.558598 1 flags.go:64] FLAG: --log-flush-frequency="5s"
I0615 10:52:15.558601 1 flags.go:64] FLAG: --logging-format="text"
I0615 10:52:15.558604 1 flags.go:64] FLAG: --master=""
I0615 10:52:15.558607 1 flags.go:64] FLAG: --permit-address-sharing="false"
I0615 10:52:15.558611 1 flags.go:64] FLAG: --permit-port-sharing="false"
I0615 10:52:15.558623 1 flags.go:64] FLAG: --pod-max-in-unschedulable-pods-duration="5m0s"
I0615 10:52:15.558626 1 flags.go:64] FLAG: --profiling="true"
I0615 10:52:15.558628 1 flags.go:64] FLAG: --requestheader-allowed-names="[]"
I0615 10:52:15.558634 1 flags.go:64] FLAG: --requestheader-client-ca-file=""
I0615 10:52:15.558637 1 flags.go:64] FLAG: --requestheader-extra-headers-prefix="[x-remote-extra-]"
I0615 10:52:15.558645 1 flags.go:64] FLAG: --requestheader-group-headers="[x-remote-group]"
I0615 10:52:15.558649 1 flags.go:64] FLAG: --requestheader-username-headers="[x-remote-user]"
I0615 10:52:15.558656 1 flags.go:64] FLAG: --secure-port="10259"
I0615 10:52:15.558659 1 flags.go:64] FLAG: --show-hidden-metrics-for-version=""
I0615 10:52:15.558661 1 flags.go:64] FLAG: --tls-cert-file=""
I0615 10:52:15.558664 1 flags.go:64] FLAG: --tls-cipher-suites="[]"
I0615 10:52:15.558670 1 flags.go:64] FLAG: --tls-min-version=""
I0615 10:52:15.558673 1 flags.go:64] FLAG: --tls-private-key-file=""

I0615 10:54:11.904178 1 log.go:194] Pod nginx3 is in Prefilter phase.
I0615 10:54:11.905685 1 log.go:194] Pod nginx3 is in Score phase. Calculate the score of Node kind-worker2.
I0615 10:54:11.905713 1 log.go:194] Pod nginx3 is in Score phase. Calculate the score of Node kind-worker.
I0615 10:54:11.919614 1 schedule_one.go:252] "Successfully bound pod to node" pod="default/nginx3" node="kind-worker2" evaluatedNodes=3 feasibleNodes=2
I0615 10:54:54.087268 1 log.go:194] Pod nginx2 is in Prefilter phase.
I0615 10:54:54.088363 1 log.go:194] Pod nginx2 is in Score phase. Calculate the score of Node kind-worker.
I0615 10:54:54.088416 1 log.go:194] Pod nginx2 is in Score phase. Calculate the score of Node kind-worker2.
I0615 10:54:54.093934 1 schedule_one.go:252] "Successfully bound pod to node" pod="default/nginx2" node="kind-worker2" evaluatedNodes=3 feasibleNodes=2
I0615 10:54:54.137078 1 log.go:194] Pod nginx3 is in Prefilter phase.
I0615 10:54:54.137579 1 log.go:194] Pod nginx3 is in Score phase. Calculate the score of Node kind-worker2.
I0615 10:54:54.137606 1 log.go:194] Pod nginx3 is in Score phase. Calculate the score of Node kind-worker.
I0615 10:54:54.142629 1 schedule_one.go:252] "Successfully bound pod to node" pod="default/nginx3" node="kind-worker2" evaluatedNodes=3 feasibleNodes=2
```

## Status in most mode

```
● student@ds-student7:~/NTHU-Scheduler-Plugin-main$ kubectl get po -o wide
NAME                                READY   STATUS    RESTARTS   AGE   IP              NODE             NOMINATED NODE   READINESS GATES
my-scheduler-69cfc986c7-nhb7w      1/1     Running   0           2m45s  10.244.2.3      kind-worker2      <none>            <none>
nginx                                1/1     Running   0           29m   10.244.1.2      kind-worker        <none>            <none>
nginx2                              1/1     Running   0           5s    10.244.2.5      kind-worker2      <none>            <none>
nginx3                              1/1     Running   0           5s    10.244.2.6      kind-worker2      <none>            <none>
```