Installing and using the Strimzi Operator with minikube

Install `minikube`

Make certain you have **`kubectl`** installed. You can install `kubectl` according to the instructions in Install and Set Up kubectl.

If you do not already have a hypervisor installed, install one of these now:

- KVM, which also uses QEMU
- VirtualBox

Download the latest version of minikube
https://github.com/kubernetes/minikube/releases

```
$ sudo dnf install <path to>minikube-1.9.2-0.x86_64.rpm
```

or

```
$ curl -L0 minikube
https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64 \
&& chmod +x minikube

$ sudo mkdir -p /usr/local/bin/
$ sudo install minikube /usr/local/bin/

$ minikube version
minikube version: v1.9.2
commit: 93af9c1e43cab9618e301bc9fa720c63d5efa393
```

See https://kubernetes.io/docs/tasks/tools/install-minikube/ for additional info.

Start minikube

You can choose the driver, options are virtualbox, kvm, and podman (experimental).

```
$ minikube start --driver=virtualbox --kubernetes-version=1.18.0
😄 minikube v1.9.2 on Fedora 31
✨  Using the virtualbox driver based on user configuration
💿  Downloading VM boot image ...
    > minikube-v1.9.0.iso.sha256: 65 B / 65 B [--------------] 100.00% ? p/s
0s
    > minikube-v1.9.0.iso: 174.93 MiB / 174.93 MiB [-] 100.00% 9.20 MiB p/s
20s
👍  Starting control plane node m01 in cluster minikube
💾  Downloading Kubernetes v1.18.0 preload ...
    > preloaded-images-k8s-v2-v1.18.0-docker-overlay2-amd64.tar.lz4: 542.91
MiB
🔥  Creating virtualbox VM (CPUs=2, Memory=5900MB, Disk=20000MB) ...
🐳  Preparing Kubernetes v1.18.0 on Docker 19.03.8 ...
🌟  Enabling addons: default-storageclass, storage-provisioner
🏄  Done! kubectl is now configured to use "minikube"
```

```
$ minikube status
m01
host: Running
kubelet: Running
apiserver: Running
kubeconfig: Configured
```

Install the Strimzi Operator

```
$ curl -L0 https://strimzi.io/install/latest
```

```
$ curl -L0 https://strimzi.io/install/latest | sed 's/namespace: .*/namespace:
default/' | kubectl apply -f -
```

```
$ kubectl get pods
```

```
NAME                                        READY   STATUS    RESTARTS   AGE
strimzi-cluster-operator-6c8d574d49-hch89   1/1     Running   0          91s
```

Create the Kafka Cluster

```
$ curl -L0 https://strimzi.io/examples/latest/kafka/kafka-persistent.yaml | vi
-

apiVersion: kafka.strimzi.io/v1beta1
kind: Kafka
metadata:
  name: my-cluster
spec:
  kafka:
    version: 2.4.0
    replicas: 3
    listeners:
      plain: {}
      tls: {}
      external:
        type: loadbalancer
        tls: false
    config:
      offsets.topic.replication.factor: 3
      transaction.state.log.replication.factor: 3
      transaction.state.log.min.isr: 2
      log.message.format.version: "2.4"
    storage:
      type: jbod
      volumes:
      - id: 0
        type: persistent-claim
        size: 100Gi
        deleteClaim: false
  zookeeper:
    replicas: 3
    storage:
      type: persistent-claim
      size: 100Gi
      deleteClaim: false
  entityOperator:
    topicOperator: {}
    userOperator: {}
:w ! kubectl apply -f -

kafka.kafka.strimzi.io/my-cluster created
```

Use ‘`minikube tunnel`’ to expose external IP

`minikube tunnel` runs as a process, creating a network route on the host to the service CIDR of the cluster using the cluster’s IP address as a gateway. The tunnel command exposes the external IP directly to any program running on the host operating system.

In another terminal, run:

```
$ minikube tunnel

Status:
      machine: minikube
      pid: 112455
      route: 10.96.0.0/12 -> 192.168.99.102
      minikube: Running
      services: [my-cluster-kafka-0, my-cluster-kafka-1, my-cluster-kafka-2,
my-cluster-kafka-external-bootstrap]
    errors:
            minikube: no errors
            router: no errors
            loadbalancer emulator: no errors
```

```
$ kubectl get pods

NAME                                           READY   STATUS    RESTARTS   AGE
my-cluster-entity-operator-5dd6d7f5bd-c76b4    3/3     Running   0          88m
my-cluster-kafka-0                             2/2     Running   0          88m
my-cluster-kafka-1                             2/2     Running   0          88m
my-cluster-kafka-2                             2/2     Running   0          88m
my-cluster-zookeeper-0                         2/2     Running   0          90m
my-cluster-zookeeper-1                         2/2     Running   0          90m
my-cluster-zookeeper-2                         2/2     Running   0          90m
strimzi-cluster-operator-6c8d574d49-hch89      1/1     Running   0
107m
```

```
$ kubectl get kafka -o yaml

apiVersion: v1
items:
- apiVersion: kafka.strimzi.io/v1beta1
  kind: Kafka
  metadata:
    annotations:
      kubectl.kubernetes.io/last-applied-configuration: |

{"apiVersion":"kafka.strimzi.io/v1beta1","kind":"Kafka","metadata":{"annotatio
ns":{},"name":"my-cluster","namespace":"default"},"spec":{"entityOperator":{"t
opicOperator":{},"userOperator":{}},"kafka":{"config":{"log.message.format.ver
sion":"2.4","offsets.topic.replication.factor":3,"transaction.state.log.min.is
r":2,"transaction.state.log.replication.factor":3},"listeners":{"external":{"t
ls":false,"type":"loadbalancer"},"plain":{},"tls":{}},"replicas":3,"storage":{
"type":"jbod","volumes":[{"deleteClaim":false,"id":0,"size":"100Gi","type":"pe
rsistent-claim"}]},"version":"2.4.0"},"zookeeper":{"replicas":3,"storage":{"de
leteClaim":false,"size":"100Gi","type":"persistent-claim"}}}}
    creationTimestamp: "2020-04-15T14:40:27Z"
    generation: 1
    managedFields:
    - apiVersion: kafka.strimzi.io/v1beta1
      fieldsType: FieldsV1
      fieldsV1:
        f:spec:
          f:entityOperator:
            f:topicOperator:
              f:reconciliationIntervalSeconds: {}
              f:topicMetadataMaxAttempts: {}
              f:zookeeperSessionTimeoutSeconds: {}
            f:userOperator:
              f:reconciliationIntervalSeconds: {}
              f:zookeeperSessionTimeoutSeconds: {}
        f:status:
          f:conditions: {}
          f:listeners: {}
          f:observedGeneration: {}
      manager: okhttp
      operation: Update
      time: "2020-04-15T14:43:17Z"
    name: my-cluster
    namespace: default
    resourceVersion: "4802"
    selfLink:
/apis/kafka.strimzi.io/v1beta1/namespaces/default/kafkas/my-cluster
    uid: 55993681-f909-40ad-ba4c-b94968aba11f
  spec:
```

```
  entityOperator:
    topicOperator: {}
    userOperator: {}
  kafka:
    config:
      log.message.format.version: "2.4"
      offsets.topic.replication.factor: 3
      transaction.state.log.min.isr: 2
      transaction.state.log.replication.factor: 3
    listeners:
      external:
        tls: false
        type: loadbalancer
      plain: {}
      tls: {}
    replicas: 3
    storage:
      type: jbod
      volumes:
      - deleteClaim: false
        id: 0
        size: 100Gi
        type: persistent-claim
    version: 2.4.0
  zookeeper:
    replicas: 3
    storage:
      deleteClaim: false
      size: 100Gi
      type: persistent-claim
status:
  conditions:
  - lastTransitionTime: 2020-04-15T14:43:17+0000
    status: "True"
    type: Ready
  listeners:
  - addresses:
    - host: my-cluster-kafka-bootstrap.default.svc
      port: 9092
    type: plain
  - addresses:
    - host: my-cluster-kafka-bootstrap.default.svc
      port: 9093
    certificates:
    - |
      -----BEGIN CERTIFICATE-----
      MIIDLTCCAhWgAwIBAg…
      ...
```

```
        -----END CERTIFICATE-----
      type: tls
    - addresses:
      - host: 10.102.68.38     //Note the IP address
        port: 9094            //Note the port
      type: external
    observedGeneration: 1
kind: List
metadata:
  resourceVersion: ""
  selfLink: ""
```

Create a Kafka topic

Change the partitions and replicas to **3** for a more compelling demo.

```
$ curl -L0 https://strimzi.io/examples/latest/topic/kafka-topic.yaml | vi -

apiVersion: kafka.strimzi.io/v1beta1
kind: KafkaTopic
metadata:
  name: my-topic
  labels:
    strimzi.io/cluster: my-cluster
spec:
  partitions: 3
  replicas: 3
  config:
    retention.ms: 7200000
    segment.bytes: 1073741824
:w ! kubectl apply -f -
```

Edit and run the Producer/Consumer *(see files below)*

```
$ cd <path to source>
```

```
$ code .
```

Add the server IP and port from the output of the ‘**kubectl get kafka -o yaml**’ command to both Producer.java (line 31) and Consumer.java (line 32):

```
        -----END CERTIFICATE-----
      type: tls
    - addresses:
      - host: 10.102.68.38
        port: 9094
      type: external
    observedGeneration: 1
kind: List
metadata:
  resourceVersion: ""
  selfLink: ""
```

```
/*
 * Producer configuration
 */
    Map<String, Object> props = new HashMap();
    props.put(ProducerConfig.BOOTSTRAP_SERVERS_CONFIG, "10.102.68.38:9094");
```

```
/*
 * Consumer configuration
 */
    Map<String, Object> props = new HashMap();
    props.put(ConsumerConfig.BOOTSTRAP_SERVERS_CONFIG, "10.102.68.38:9094");
```

Run Producer.java, notice the message was sent to partition 1, offset 1:

```
[main] INFO io.strimzi.demo.Producer - Message sent (topic my-topic, partition
1, offset 1)
```

Run Consumer.java, notice the ‘Hello World’ message was received:

```
[main] INFO io.strimzi.demo.Consumer - Received message: null / Hello World
(from topic my-topic, partition 1, offset 1)
```

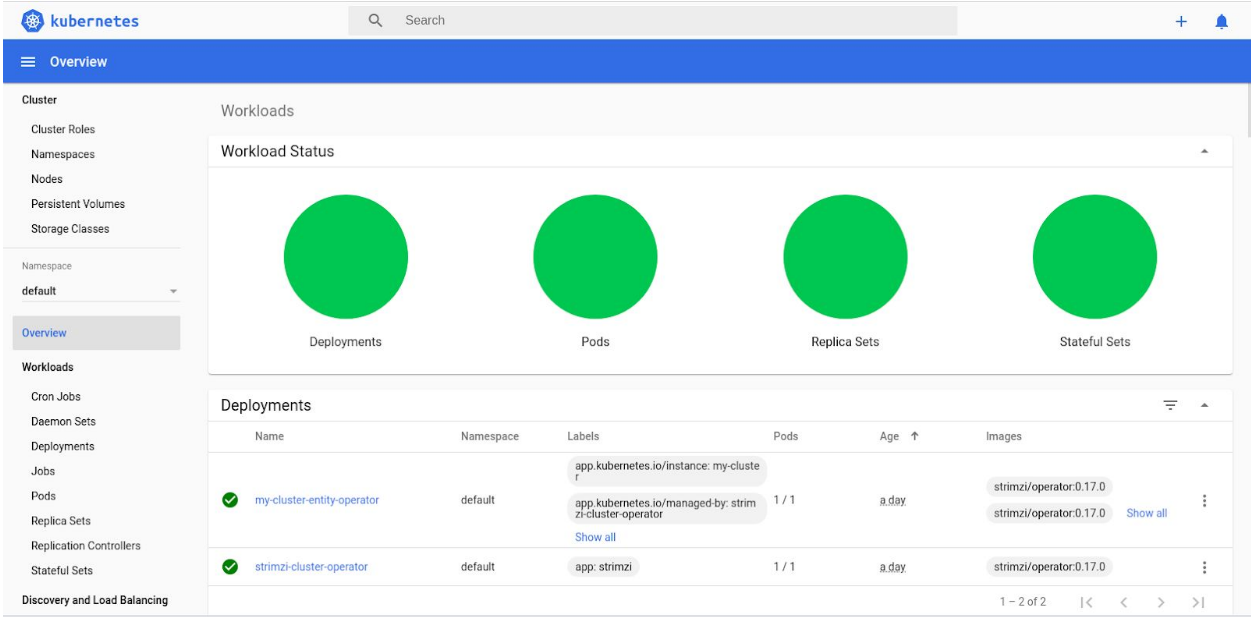
Stop `minikube`

```
$ minikube stop
✋  Stopping "minikube" in virtualbox ...
🛑  Node "m01" stopped.
```

View the `minikube` dashboard

```
$ minikube dashboard

🤔  Verifying dashboard health ...
🚀  Launching proxy ...
🤔  Verifying proxy health ...
🎉  Opening
http://127.0.0.1:36805/api/v1/namespaces/kubernetes-dashboard/services/http:ku
bernetes-dashboard:/proxy/ in your default browser...
[205204:205204:0416/155240.945361:ERROR:edid_parser.cc(102)] Too short EDID
data: manufacturer id
[205204:205204:0416/155240.945618:ERROR:edid_parser.cc(102)] Too short EDID
data: manufacturer id
Opening in existing browser session.
```



Deployments

	Name	Namespace	Labels	Pods	Age ↑	Images	
✓	my-cluster-entity-operator	default	app.kubernetes.io/instance: my-cluste r app.kubernetes.io/managed-by: strim zi-cluster-operator Show all	1 / 1	a day	strimzi/operator:0.17.0 strimzi/operator:0.17.0 Show all	⋮
✓	strimzi-cluster-operator	default	app: strimzi	1 / 1	a day	strimzi/operator:0.17.0	⋮

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