Comparison of Stand-Alone Containerized App vs Clustered Containerized App with OpenShift

Stand Alone Containerized MariaDB

Clustered Containerized MariaDB with OpenShift

1. Create PersistentVolume 2. Create PersistentVolumeClaim 1. Create OS Path for Persistent Volume \$ vi pv-mariadb.yaml \$ vi pvc-mariadb.yaml api # mkdir /root/var/lib/mysql apiVersion: v1 version: v1 # mount /dev/sdd /root/var/lib/mysql kind: PersistentVolume kind: PersistentVolumeClaim metadata: metadata: or name: mariadb-wp-claim name: mariadb-wp-volume labels: spec: 1. Create Docker Persistent Volume Resource accessModes: name: wordpress spec: ReadWriteMany \$ docker volume create mariadb-vol capacity: accessModes: storage: 3Gi - ReadWriteMany persistentVolumeReclaimPolicy: Recycle resources: requests: path: /exports/mariadb-wp storage: 3Gi server: services.lab.example.com \$ oc create -f pvc-mariadb.yaml \$ oc create -f pv-mariadb.yaml 2. Use Virtual Network (Software Defined Network) docker network create --attachable mariadb-privnet 3. Run oc new-app 3. Run MariaDB Container \$ docker container run -d --name wordpressdb \ \$ oc new-app --name wordpressdb \ -e MYSQL_ROOT_PASSWORD='redhat' \ -e MYSQL ROOT PASSWORD='redhat' \ -e MYSQL_DATABASE='wordpress' \ -e MYSQL_DATABASE='wordpress' \ -e MYSQL_USER='wordpress' \ -e MYSQL USER='wordpress' \ -e MYSQL_PASSWORD='redhat' \ -e MYSQL_PASSWORD='redhat' \ -v /root/var/lib/mysql:/var/lib/mysql \ docker.io/mariadb:latest -v mariadb-vol:/var/lib/mysql \ 4. Run oc expose --network mariadb-privnet \ \$ oc expose svc/mymariadb_ -p 3306:3306 docker.io/mariadb:latest Route Service - apiVersion: v1 - apiVersion: v1 kind: Route kind: Service metadata: metadata: annotations: annotations: openshift.io/host.generated: "true" openshift.io/generated-by:... creationTimestamp: null creationTimestamp: null labels: labels: app: mymariadb app: mymariadb name: mymariadb name: mymariadb spec: host: mymariadb-docker-mariadb.router.default.svc.cluster.local ports: - name: 3306-tcp targetPort: 3306-tcp port: 3306 to: protocol: TCP kind: Service targetPort: 3306 name: mymariadb selector: weight: 100 app: mymariadb wildcardPolicy: None deploymentconfig: mymariadb status: sessionAffinity: None ingress: type: ClusterIP - conditions: status: - lastTransitionTime: "2020-05-07T23:57:55Z" loadBalancer: {} status: "True" type: Admitted host: mymariadb-docker-mariadb.router.default.svc.cluster.local routerName: router wildcardPolicy: None

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Other Resources created by oc new-app

```
ImageStream
apiVersion: v1
 kind: ImageStream
  metadata:
    annotations:
      open shift. io/generated-by: \ Open Shift New App
      openshift.io/image.dockerRepositoryCheck: ...
    creationTimestamp: null
    generation: 2
    labels:
      app: mymariadb
    name: mymariadb
  spec:
    lookupPolicy:
      local: false
    tags:
    - annotations:
        openshift.io/imported-from:
docker.io/mariadb:latest
        kind: DockerImage
        name: docker-registry.default.svc:5000/docker-
mariadb/mymariadb:latest
      generation: 2
      importPolicy: {}
      name: latest
      referencePolicy:
       type: Source
```

```
dockerImageRepository: ""
DeploymentConfig
- apiVersion: v1
 kind: DeploymentConfig
  metadata:
    annotations:
      openshift.io/generated-by: OpenShiftNewApp
    generation: 1
    labels:
      app: mymariadb
    name: mymariadb
  spec:
    replicas: 1
    revisionHistoryLimit: 10
    selector:
      app: mymariadb
      deploymentconfig: mymariadb
    strategy:
      activeDeadlineSeconds: 21600
      resources: {}
      rollingParams:
intervalSeconds: 1
        maxSurge: 25%
        maxUnavailable: 25%
        timeoutSeconds: 600
        updatePeriodSeconds: 1
      type: Rolling
    template:
      metadata:
        annotations:
          openshift.io/generated-by: OpenShiftNewApp
        creationTimestamp: null
        labels:
          app: mymariadb
          deploymentconfig: mymariadb
      spec:
        containers:
          - name: MYSQL_DATABASE
            value: wordpress
          - name: MYSQL_PASSWORD
            value: redhat
          - name: MYSQL_ROOT_PASSWORD
            value: redhat
            name: MYSOL US
            value: wordpress
          image: docker.io/mariadb@sha256:a818b26d8131199f092e5cb
          imagePullPolicy: Always
          name: mymariadb
          ports:
          - containerPort: 3306
           protocol: TCP
          resources: {}
          terminationMessagePath: /dev/termination-log
          {\tt termination} {\tt MessagePolicy:} \ {\tt File}
          volumeMounts:
          - mountPath: /var/lib/mysql
            name: mymariadb-volume-1
        dnsPolicy: ClusterFirst
        restartPolicy: Always
        schedulerName: default-scheduler
        securityContext: {}
        terminationGracePeriodSeconds: 30
        volumes:
          emptyDir: {}
          name: mymariadb-volume-1
    test: false
   triggers:
    - type: ConfigChange
    - imageChangeParams:
        automatic: true
        containerNames:
        - mymariadb
        from:
          kind: ImageStreamTag
          name: mymariadb:latest
          namespace: docker-mariadb
      type: ImageChange
  status:
    availableReplicas: 0
    latestVersion: 0
    observedGeneration: 0
    replicas: 0
    unavailableReplicas: 0
    updatedReplicas: 0
```

```
ReplicationController
```

```
apiVersion: v1
kind: ReplicationController
metadata:
  annotations:
     openshift.io/deployer-pod.completed-at: ...
     openshift.io/deployer-pod.created-at: ...
     openshift.io/deployer-pod.name: mymariadb-1-deploy
    openshift.io/deployment-config.latest-version: "1" openshift.io/deployment-config.name: mymariadb
    openshift.io/deployment.phase: Complete openshift.io/deployment.replicas: "1"
     open shift. io/deployment. status-reason: \ config \ change
     openshift.io/encoded-deployment-config: |
  creationTimestamp: null
  generation: 1
  labels:
     app: mymariadb
     openshift.io/deployment-config.name: mymariadb
  name: mymariadb-1
  ownerReferences:
    apiVersion: apps.openshift.io/v1
     blockOwnerDeletion: true
     controller: true
     kind: DeploymentConfig
     name: mymariadb
    uid: d243b370-90bd-11ea-b78b-5254002f43ae
  replicas: 1
  selector:
     app: mymariadb
     deployment: mymariadb-1
     deploymentconfig: mymariadb
  template:
     metadata:
       annotations:
         openshift.io/deployment-config.latest-version: "1"
         openshift.io/deployment-config.name: mymariadb
         openshift.io/deployment.name: mymariadb-1
       openshift.io/generated-by: OpenShiftNewApp creationTimestamp: null
       labels:
         app: mymariadb
         deployment: mymariadb-1
         deploymentconfig: mymariadb
       containers:
       - env:
         - name: MYSQL_DATABASE
         value: wordpress
- name: MYSQL_PASSWORD
           value: redhat
         - name: MYSQL_ROOT_PASSWORD
           value: redhat
         - name: MYSQL_USER
           value: wordpress
         image: docker.io/mariadb@sha256:9727537826a818e5cb
         imagePullPolicy: Always
         name: mymariadb
         ports:
          - containerPort: 3306
           protocol: TCP
         resources: {}
         terminationMessagePath: /dev/termination-log
         terminationMessagePolicy: File
         volumeMounts:
         - mountPath: /var/lib/mysql
           name: mymariadb-volume-1
       dnsPolicy: ClusterFirst
       restartPolicy: Always
       schedulerName: default-scheduler
       securityContext: {}
       terminationGracePeriodSeconds: 30
       volumes:
       - emptyDir: {}
         name: mymariadb-volume-1
  replicas: 0
```

```
- apiVersion: v1
 kind: Pod
 metadata:
    annotations:
     openshift.io/deployment-config.latest-version: "1"
    creationTimestamp: null
    generateName: mymariadb-1-
    labels:
     app: mymariadb
      deployment: mymariadb-1
     deploymentconfig: mymariadb
    ownerReferences:
     apiVersion: v1
     blockOwnerDeletion: true
     controller: true
     kind: ReplicationController
     name: mymariadb-1
     uid: d3018abd-90bd-11ea-b78b-5254002f43ae
   containers:
    - env:
      - name: MYSQL_DATABASE
      value: wordpress
- name: MYSQL_PASSWORD
       value: redhat
      - name: MYSQL_ROOT_PASSWORD
       value: redhat
      name: MYSQL_USER
       value: wordpress
     image: docker.io/mariadb@sha2190aa60d14cc91d7bdcd983009faf8
     imagePullPolicy: Always
     name: mymariadb
     ports:
       containerPort: 3306
       protocol: TCP
     resources: {}
     securityContext:
        capabilities:
          drop:
          - KILL

    MKNOD

          - SETGID
          - SETUID
        runAsUser: 1000160000
      terminationMessagePath: /dev/termination-log
     terminationMessagePolicy: File
     volumeMounts:
      - mountPath: /var/lib/mysql
       name: mymariadb-volume-1
       mountPath: /var/run/secrets/kubernetes.io/serviceaccount
        name: default-token-pqwqk
        readOnly: true
    dnsPolicy: ClusterFirst
    imagePullSecrets:
    - name: default-dockercfg-z66m6
    nodeName: student51-master.lab.example.com
    nodeSelector:
     node-role.kubernetes.io/compute: "true"
    restartPolicy: Always
    schedulerName: default-scheduler
    securityContext:
     fsGroup: 1000160000
     seLinuxOptions:
       level: s0:c13,c2
    serviceAccount: default
    serviceAccountName: default
    terminationGracePeriodSeconds: 30
    volumes:
    - emptyDir: {}
     name: mymariadb-volume-1
    - name: default-token-pqwqk
     secret:
       defaultMode: 420
        secretName: default-token-pqwqk
   phase: Pending
```

Additional Resources for Building Application with S2I

```
BuildConfig
- apiVersion: v1
 kind: BuildConfig
  metadata:
   annotations:
     openshift.io/generated-by: OpenShiftNewApp
    creationTimestamp: null
   labels:
     app: php-helloworld
    name: php-helloworld
   failedBuildsHistoryLimit: 5
   nodeSelector: null
   output:
     to:
       kind: ImageStreamTag
       name: php-helloworld:latest
    postCommit: {}
   resources: {}
   runPolicy: Serial
   source:
     git:
       uri: https://github.com/furqanpr/php-helloworld.git
     type: Git
    strategy:
      sourceStrategy:
         kind: ImageStreamTag
         name: php:7.1
         namespace: openshift
     type: Source
    successfulBuildsHistoryLimit: 5
   triggers:
    - github:
       secret: f8lsLVnZZnQB8aC9usQE
     type: GitHub
    - generic:
       secret: T593WknjrYk9WCdFFBDl
     type: Generic
    - type: ConfigChange
   - imageChange: {}
      type: ImageChange
  status:
   lastVersion: 0
```

```
Build
- apiVersion: v1
     kind: Build
    metadata:
          annotations:
               open shift.io/build-config.name:\ php-helloworld
               openshift.io/build.number: "1"
               openshift.io/build.pod-name: php-helloworld-1-build
           creationTimestamp: null
          labels:
               app: php-helloworld
               buildconfig: php-helloworld
               openshift.io/build-config.name: php-helloworld
               openshift.io/build.start-policy: Serial
          name: php-helloworld-1
          ownerReferences:
            apiVersion: build.openshift.io/v1
               controller: true
               kind: BuildConfig
               name: php-helloworld
               uid: 80c2938b-9061-11ea-b78b-5254002f43ae
    spec:
          nodeSelector: null
          output:
               pushSecret:
                     name: builder-dockercfg-vdqtb
                     kind: ImageStreamTag
                    name: php-helloworld:latest
           postCommit: {}
          resources: {}
          revision:
               git:
                           email: 46949889+furqanpr@users.noreply.github.com
                          name: furqanpr
                     commit: f13fa001fb83f13df9b4aa4b3a8f9c5ad48b511c
                     committer:
                           email: noreply@github.com
                           name: GitHub
                     message: Create index.php
                type: Git
           serviceAccount: builder
          source:
                     uri: https://github.com/furqanpr/php-helloworld.git
               type: Git
          strategy:
               sourceStrategy:
                          name: registry.access.redhat.com/rhscl/php-71-rhel7@sha256:289ef5852151a1a3ea4fdf2581a86e6d2b8d
               type: Source
          triggeredBy:
           - imageChangeBuild:
                     fromRef:
                           kind: ImageStreamTag
                           name: php:7.1
                           namespace: openshift
                     imageID: registry.access.redhat.com/rhscl/php-71-rhel7@sha256:289ef5852151a1a3ea4fdf2581a86a60ada07
message: Image change
    status:
          config:
               name: php-helloworld
          output:
                     image Digest: sha256: 63349 d9891 fbb522 d9 fe 500 e 2043 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 ac7 e a 13 e 64 fe 500 e 2043 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 ac7 e a 13 e 64 fe 500 e 2043 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 ac7 e a 13 e 64 fe 500 e 2043 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 ac7 e a 13 e 64 fe 500 e 2043 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 ac7 e a 13 e 64 fe 500 e 2043 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 ac7 e a 13 e 64 fe 500 e 2043 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 ac7 e a 13 e 64 fe 500 e 2043 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 ac7 e a 13 e 64 fe 500 e 2043 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 ac7 e a 13 e 64 fe 500 e 2043 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 ac7 e a 13 e 64 fe 500 e 2043 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 ac7 e a 13 e 64 fe 500 e 2043 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acb d7 b 63 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a 31 c 428 c 9 de 44 f 3 acc 3a
          output Docker Image Reference: \ docker-registry. default.svc: 5000/php-helloworld/php-helloworld: latest the state of t
          phase: New
          stages:
           - durationMilliseconds: 1619
               name: FetchInputs
               startTime: "2020-05-07T12:51:51Z"
               steps:
                - durationMilliseconds: 1619
                     name: FetchGitSource
                     startTime: "2020-05-07T12:51:51Z"
           - durationMilliseconds: 733
               name: CommitContainer
               startTime: "2020-05-07T12:53:23Z"
               steps:
                - durationMilliseconds: 733
                      name: commitcontainer
                     startTime: "2020-05-07T12:53:23Z"
            - durationMilliseconds: 6579
               name: Assemble
               startTime: "2020-05-07T12:53:18Z"
               steps:
                - durationMilliseconds: 6579
                     name: AssembleBuildScripts
                     startTime: "2020-05-07T12:53:18Z"
              durationMilliseconds: 95462
               name: PushImage
               startTime: "2020-05-07T12:53:24Z"
               steps:
                - durationMilliseconds: 95462
                     name: PushImage
                     startTime: "2020-05-07T12:53:24Z"
```