СЛЁРМ
+
Southbridge

Хранение данных на примере ceph

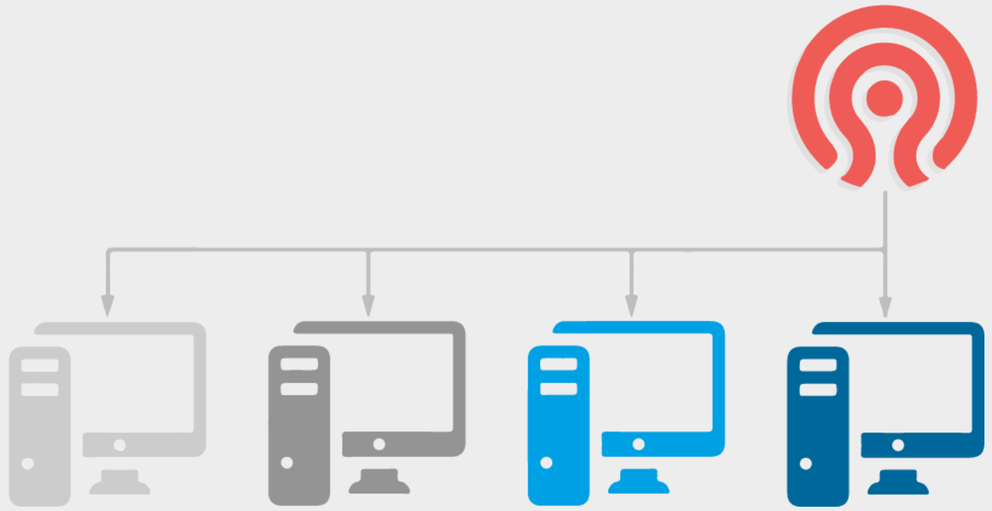
Сергей Бондарев
Архитектор Southbridge

slurm.io

Установка Ceph

Сценарий https://github.com/ceph/ceph-ansible

```
git clone git@gitlab.slurm.io:slurm/ceph-nautilus.git
cd ceph-nautilus
sh _deploy_cluster.sh
```



Подключение к подам

```
apiVersion: v1
kind: Pod
metadata:
  name: test
spec:
  containers:
  - image: k8s.gcr.io/test-webserver
    name: test-container
    volumeMounts:
    - mountPath: /test
      name: test-volume
  volumes:
  - name: test-volume
    # This AWS EBS volume must already exist.
    awsElasticBlockStore:
      volumeID: <volume-id>
      fsType: ext4
```

Подключение к подам

Типы томов:

https://kubernetes.io/docs/concepts/storage/volumes/#types-of-volumes

- configMap
- emptyDir
- hostPath
- secret

Проблемы:

- тома надо создавать вручную
- параметры доступа прописывать для каждого тома, каждого пода
- чтобы поменять тип подключенного тома - надо менять манифесты

Подключение к подам SC/PVC/PV

```
volumes:
  - name: mypd
    persistentVolumeClaim:
      claimName: myclaim
```

Storage class: хранит параметры подключения

PersistentVolumeClaim: описывает требования к тому

PersistentVolume: хранит параметры и статус тома

Provisioner: параметр SC, плагин создания томов

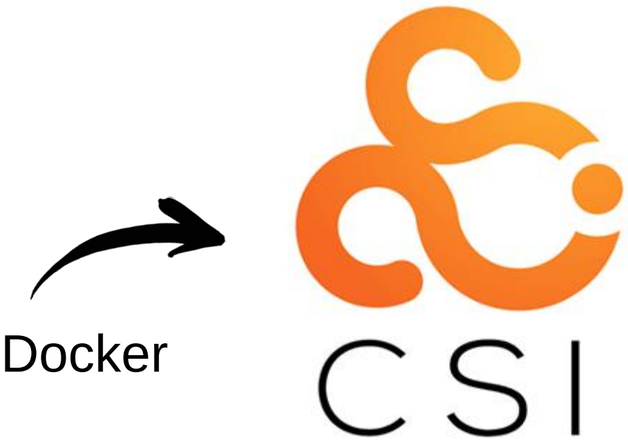
Container Storage Interface

Унифицированный интерфейс хранлищ

Node plugin – запущен на каждом узле

Controller plugin – взаимодействие с хранилищем

Cloud Foundry + Kubernetes + Mesos + Docker

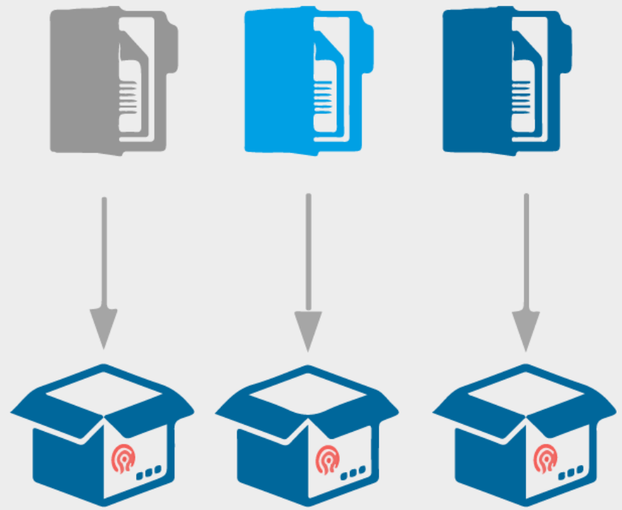


Ceph CSI

- Dynamically provision RWO and RWX mode
- Snapshot
- Resize
- Quota
- Metrics
- Topology aware

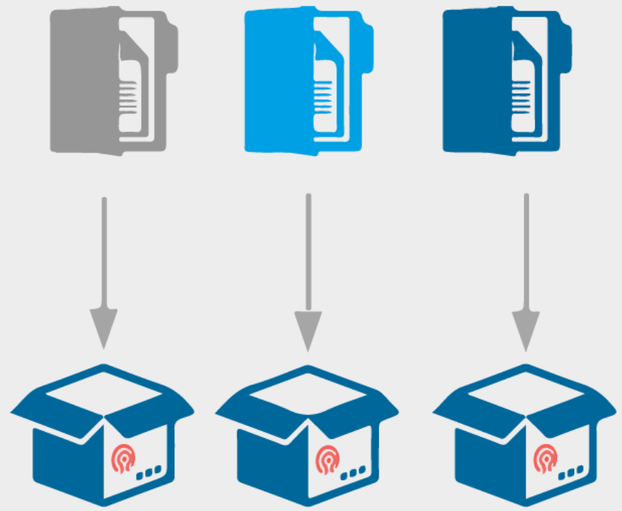
Создание пула для RBD


```
node-1# ceph osd pool create kube 32
node-1# ceph osd pool application enable kube rbd

node-1# ceph auth get-or-create client.rbdkube mon 'profile rbd' osd 'profile rbd
pool=kube'
```



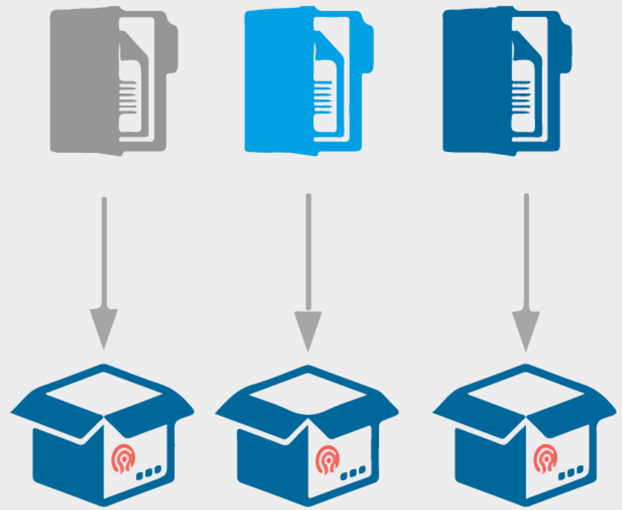
Подключение RBD


```
helm repo add ceph-csi https://ceph.github.io/csi-charts
helm inspect values ceph-csi/ceph-csi-rbd >cephrbd.yml

node-1# ceph fsid  -> - clusterID:

node-1# ceph mon dump ->  monitors:
                            - "<MONValue1>"
                            - "<MONValue2>"

helm upgrade -i ceph-csi-rbd ceph-csi/ceph-csi-rbd \
   -f cephrbd.yml -n ceph-csi-rbd --create-namespace
```



Подключение RBD

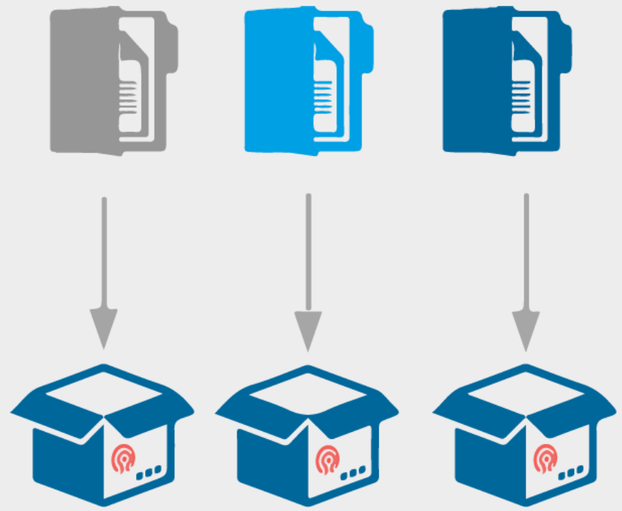

```
Client key:
node-1# ceph auth get-key client.rbdkube
master-1# kubectl apply -f secret.yaml


master-1# kubectl apply -f storageclass.yaml
```



Подключение RBD

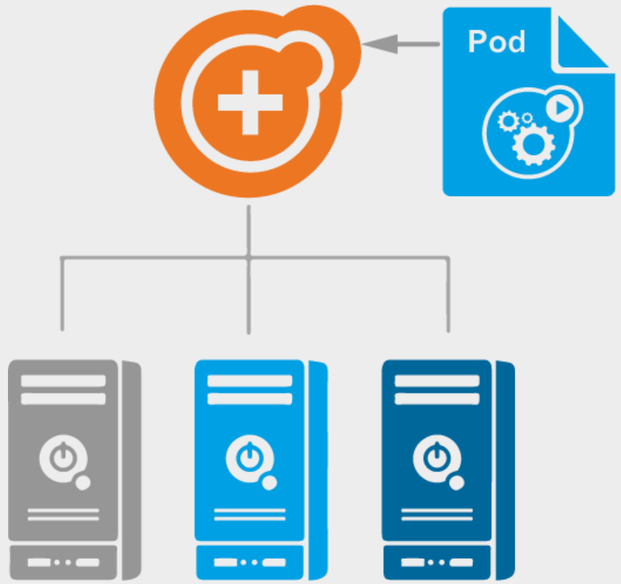
PVC

```
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: rbd-pvc
spec:
  accessModes:
    - ReadWriteOnce
  resources:
    requests:
      storage: 1Gi
  storageClassName: csi-rbd-sc
```

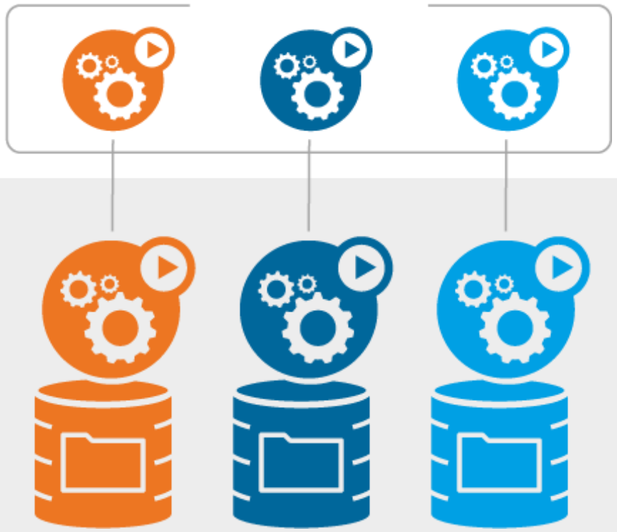


Deployment


```
apiVersion: apps/v1
kind: Deployment
spec:
  template:
    spec:
      containers:
      - volumeMounts:
        - name: data
          mountPath: /data
      volumes:
        - name: data
          persistentVolumeClaim:
            claimName: rbd-pvc
```

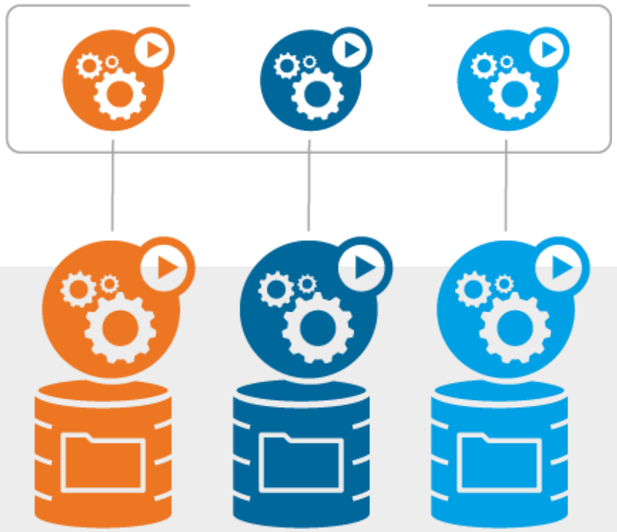


StatefulSet



```
apiVersion: apps/v1
kind: StatefulSet
spec:
  template:
   spec:
     containers:
       - volumeMounts:
        - name: mysql
          mountPath: /var/lib/mysql
  volumeClaimTemplates:
  - metadata:
      name: mysql
    spec:
      accessModes: [ "ReadWriteOnce" ]
      storageClassName: "csi-rbd-sc"
      resources:
        requests:
          storage: 1Gi
```

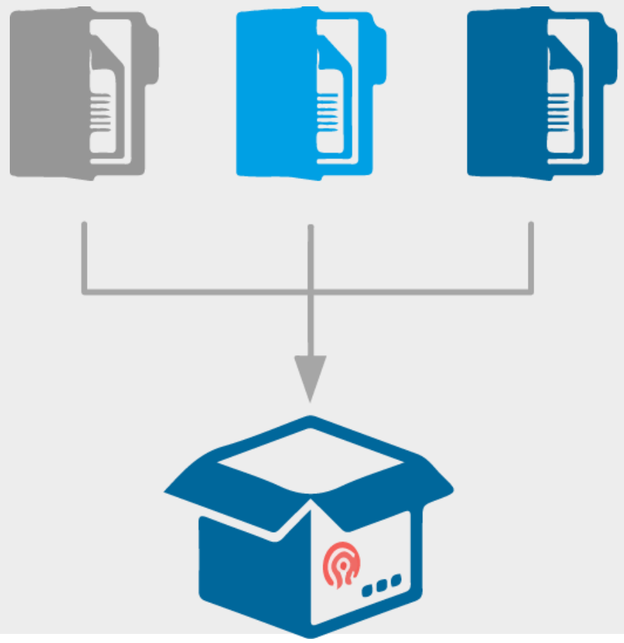
initContainers



```
spec:
  template:
   spec:
     initContainers:
     - image: busybox
       command: ["sh", "-c", "chown -R 27:27 /var/lib/mysql"]
       volumeMounts:
         - name: mysql
           mountPath: /var/lib/mysql
     containers:
     - image: mysql
       volumeMounts:
         - name: mysql
           mountPath: /var/lib/mysql
```

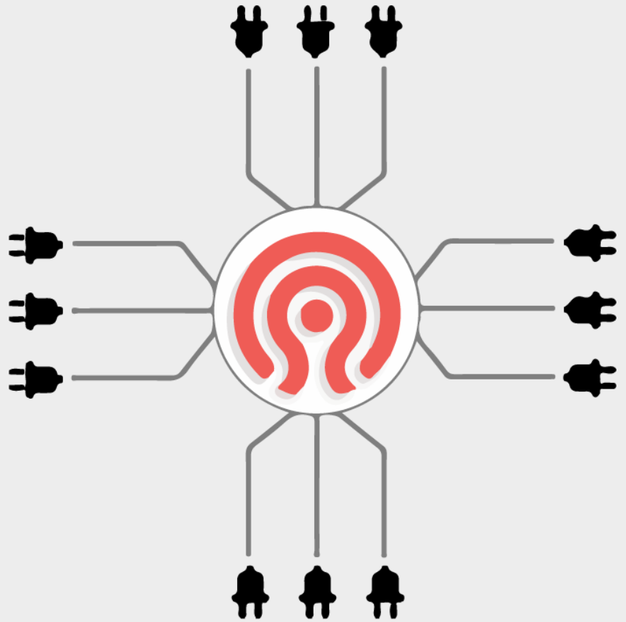
Создание пула для CephFS


```
ceph osd pool create cephfs_data 32
ceph osd pool create cephfs_metadata 32
ceph fs new cephfs cephfs_metadata cephfs_data
ceph fs ls
```



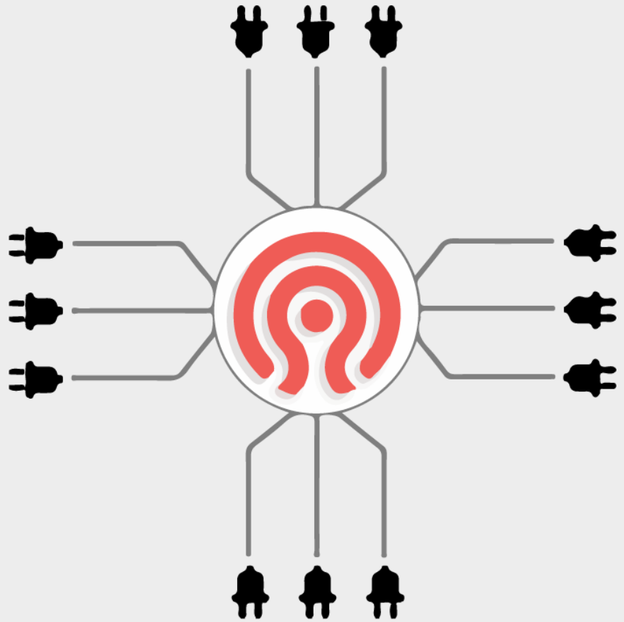
Подключение CephFS


```
helm inspect values ceph-csi/ceph-csi-cephfs >cephfs.yml

node-1# ceph fsid  -> - clusterID:

node-1# ceph mon dump ->  monitors:
                            - "<MONValue1>"
                            - "<MONValue2>"

helm upgrade -i ceph-csi-cephfs ceph-csi/ceph-csi-cephfs \
   -f cephfs.yml -n ceph-csi-cephfs --create-namespace
```



Подключение CephFS


```
CephFS user key:
node-1# ceph auth get-or-create client.fs mon 'allow r' mgr 'allow rw' mds 'allow rws'
osd 'allow rw pool=cephfs_data, allow rw pool=cephfs_metadata'

master-1# kubectl apply -f secret.yaml


master-1# kubectl apply -f storageclass.yaml
```



Спасибо!

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