Create and manage storage classes

Astra Trident

NetApp
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Table of Contents

Create and manage storage classes 1
Create a storage class 1
Manage storage classes 3

Create and manage storage classes

Create a storage class

Configure a Kubernetes StorageClass object and create the storage class to instruct Astra Trident how to provision volumes.

Configure a Kubernetes StorageClass object

The Kubernetes StorageClass object identifies Astra Trident as the provisioner that is used for that class and instructs Astra Trident how to provision a volume. For example:

```
apiVersion: storage.k8s.io/v1
kind: StorageClass
metadata:
  name: <Name>
provisioner: csi.trident.netapp.io
mountOptions: <Mount Options>
parameters:
  <Trident Parameters>
allowVolumeExpansion: true
volumeBindingMode: Immediate
```

Refer to Kubernetes and Trident objects for details on how storage classes interact with the `PersistentVolumeClaim` and parameters for controlling how Astra Trident provisions volumes.

Create a storage class

After you create the StorageClass object, you can create the storage class. Storage class samples provides some basic samples you can use or modify.

Steps

1. This is a Kubernetes object, so use `kubectl` to create it in Kubernetes.

   ```
   kubectl create -f sample-input/storage-class-basic-csi.yaml
   ```

2. You should now see a **basic-csi** storage class in both Kubernetes and Astra Trident, and Astra Trident should have discovered the pools on the backend.

```
kubectl get sc basic-csi
NAME         PROVISIONER             AGE
basic-csi    csi.trident.netapp.io   15h

./tridentctl -n trident get storageclass basic-csi -o json
{
  "items": [
    {
      "Config": {
        "version": "1",
        "name": "basic-csi",
        "attributes": {
          "backendType": "ontap-nas"
        },
        "storagePools": null,
        "additionalStoragePools": null
      },
      "storage": {
        "ontapnas_10.0.0.1": [
          "aggr1",
          "aggr2",
          "aggr3",
          "aggr4"
        ]
      }
    }
  ]
}
```

Storage class samples

Astra Trident provides simple storage class definitions for specific backends.

Alternatively, you can edit `sample-input/storage-class-csi.yaml.templ` file that comes with the installer and replace *`BACKEND_TYPE`* with the storage driver name.

```
./tridentctl -n trident get backend
+-------------+---------------+--------------------------------------
+--------+---------+
|    NAME     | STORAGE DRIVER |                 UUID                 |
STATE  | VOLUMES |
+-------------+---------------+--------------------------------------
+--------+---------+
| nas-backend | ontap-nas      | 98e19b74-aec7-4a3d-8dcf-128e5033b214 |
online |       0 |
+-------------+---------------+--------------------------------------
+--------+---------+

cp sample-input/storage-class-csi.yaml.templ sample-input/storage-class-
basic-csi.yaml

# Modify __BACKEND_TYPE__ with the storage driver field above (e.g.,
ontap-nas)
vi sample-input/storage-class-basic-csi.yaml
```

Manage storage classes

You can view existing storage classes, set a default storage class, identify the storage class backend, and delete storage classes.

View the existing storage classes

- To view existing Kubernetes storage classes, run the following command:

```
kubectl get storageclass
```

- To view Kubernetes storage class detail, run the following command:

```
kubectl get storageclass <storage-class> -o json
```

- To view Astra Trident's synchronized storage classes, run the following command:

```
tridentctl get storageclass
```

- To view Astra Trident's synchronized storage class detail, run the following command:

```
tridentctl get storageclass <storage-class> -o json
```

Set a default storage class

Kubernetes 1.6 added the ability to set a default storage class. This is the storage class that will be used to provision a Persistent Volume if a user does not specify one in a Persistent Volume Claim (PVC).

- Define a default storage class by setting the annotation `storageclass.kubernetes.io/is-default-class` to true in the storage class definition. According to the specification, any other value or absence of the annotation is interpreted as false.
- You can configure an existing storage class to be the default storage class by using the following command:

```
kubectl patch storageclass <storage-class-name> -p '{"metadata":
{"annotations":{"storageclass.kubernetes.io/is-default-class":"true"}}}'
```

- Similarly, you can remove the default storage class annotation by using the following command:

```
kubectl patch storageclass <storage-class-name> -p '{"metadata":
{"annotations":{"storageclass.kubernetes.io/is-default-class":"false"}}}'
```

There are also examples in the Trident installer bundle that include this annotation.

> There should be only one default storage class in your cluster at a time. Kubernetes does not technically prevent you from having more than one, but it will behave as if there is no default storage class at all.

Identify the backend for a storage class

This is an example of the kind of questions you can answer with the JSON that `tridentctl` outputs for Astra Trident backend objects. This uses the `jq` utility, which you may need to install first.

```
tridentctl get storageclass -o json | jq  '[.items[] | {storageClass:
.Config.name, backends: [.storage]|unique}]'
```

Delete a storage class

To delete a storage class from Kubernetes, run the following command:

```
kubectl delete storageclass <storage-class>
```

`<storage-class>` should be replaced with your storage class.

Any persistent volumes that were created through this storage class will remain untouched, and Astra Trident will continue to manage them.

Astra Trident enforces a blank `fsType` for the volumes it creates. For iSCSI backends, it is recommended to enforce `parameters.fsType` in the StorageClass. You should delete existing StorageClasses and re-create them with `parameters.fsType` specified.

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