



Create and manage storage classes

Trident

NetApp
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Table of Contents

- Create and manage storage classes 1
 - Create a storage class 1
 - Configure a Kubernetes StorageClass object 1
 - Create a storage class 1
 - Manage storage classes 3
 - View the existing storage classes 3
 - Set a default storage class 4
 - Identify the backend for a storage class 4
 - Delete a storage class 4

Create and manage storage classes

Create a storage class

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

Configure a Kubernetes StorageClass object

The [Kubernetes StorageClass object](#) identifies Trident as the provisioner that is used for that class and instructs 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 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 Trident, and 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

Trident provides [simple storage class definitions for specific backends](#).

Alternatively, you can edit `sample-input/storage-class-csi.yaml.template` 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.template 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 Trident's synchronized storage classes, run the following command:

```
tridentctl get storageclass
```

- To view 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 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 Trident will continue to manage them.



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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