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One CSI plugin for All? Experimenting Heterogeneous Storage with Single CSI Plugin for Kubernetes

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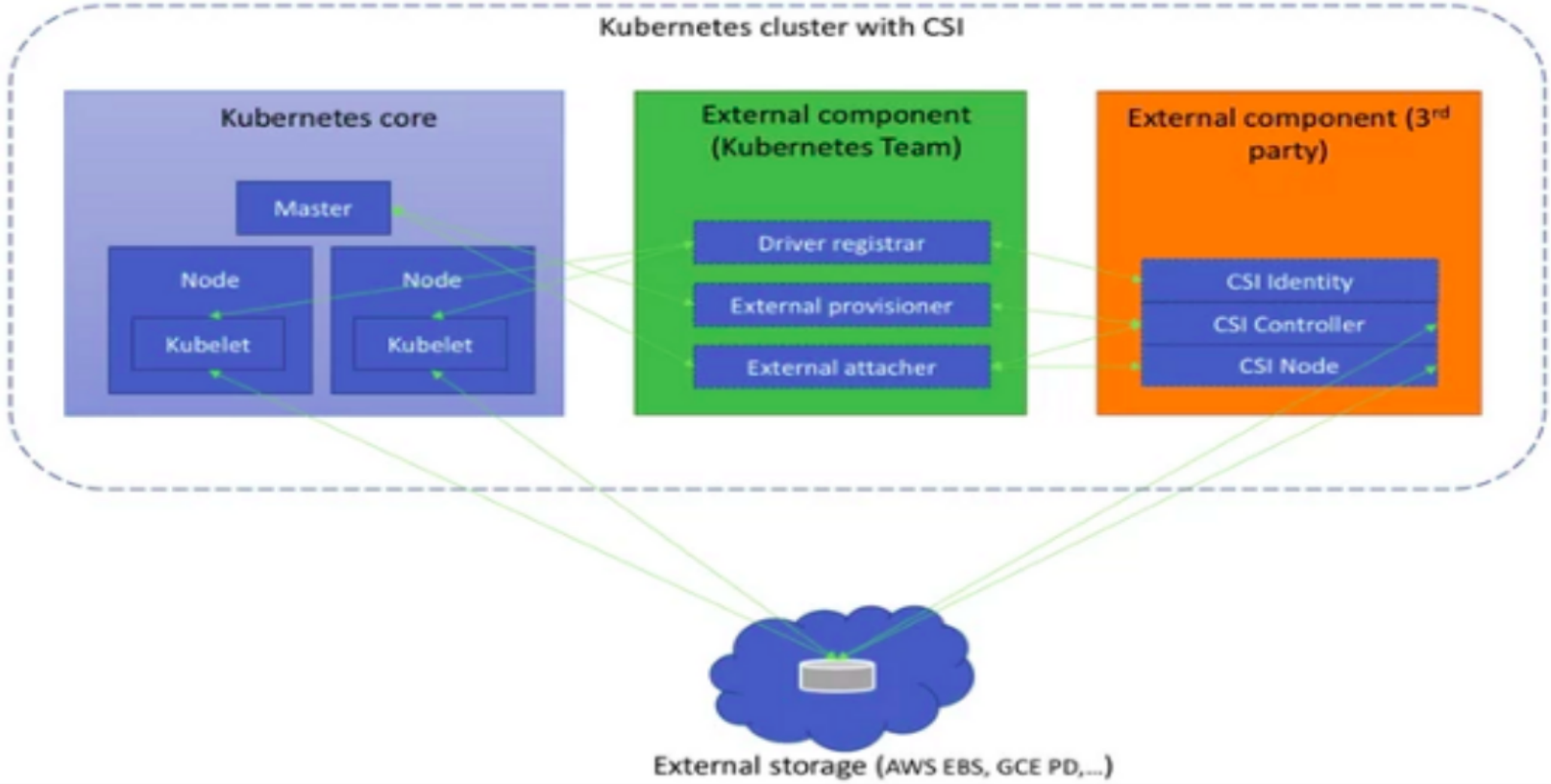
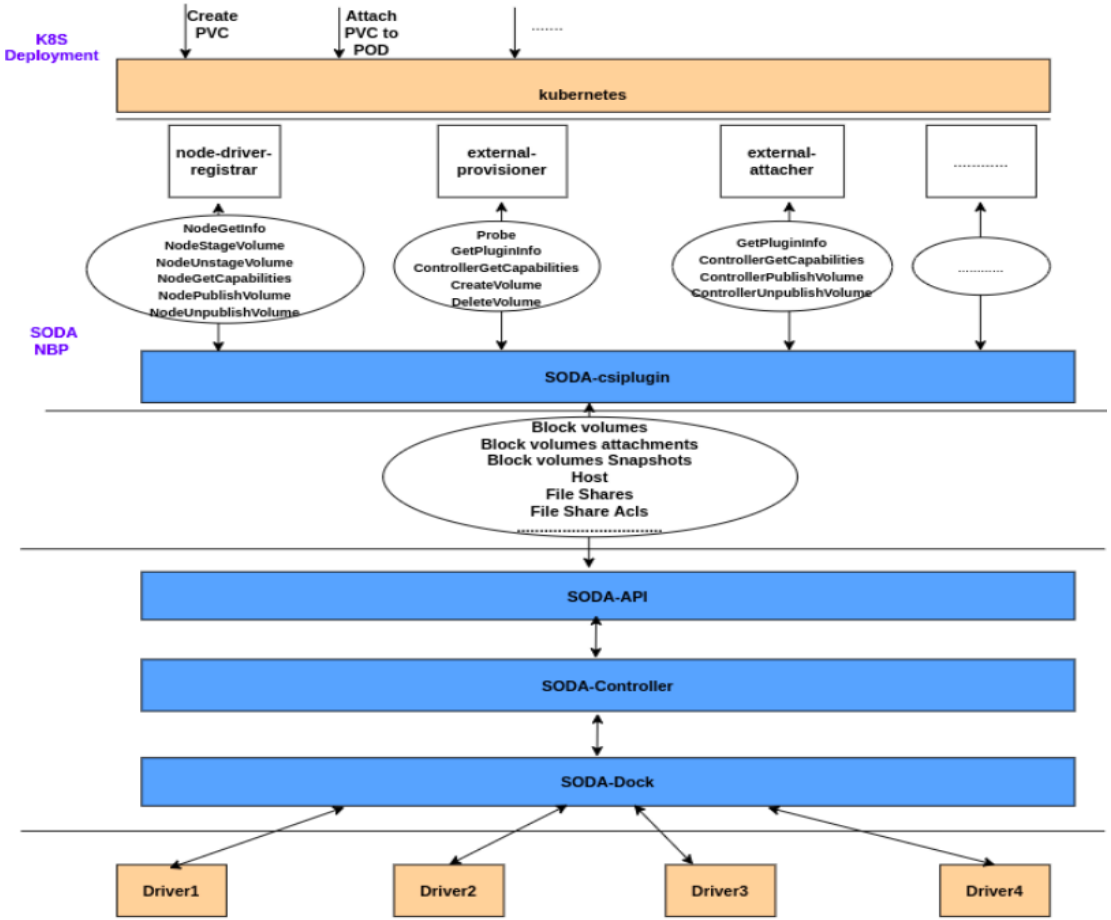
Agenda

- Brief on kubernetes and CSI interaction
- Understanding SODA CSI Plugin
- One CSI Plugin for all – 2 design options
- Demo
- Advantages

Kubernetes and CSI interaction

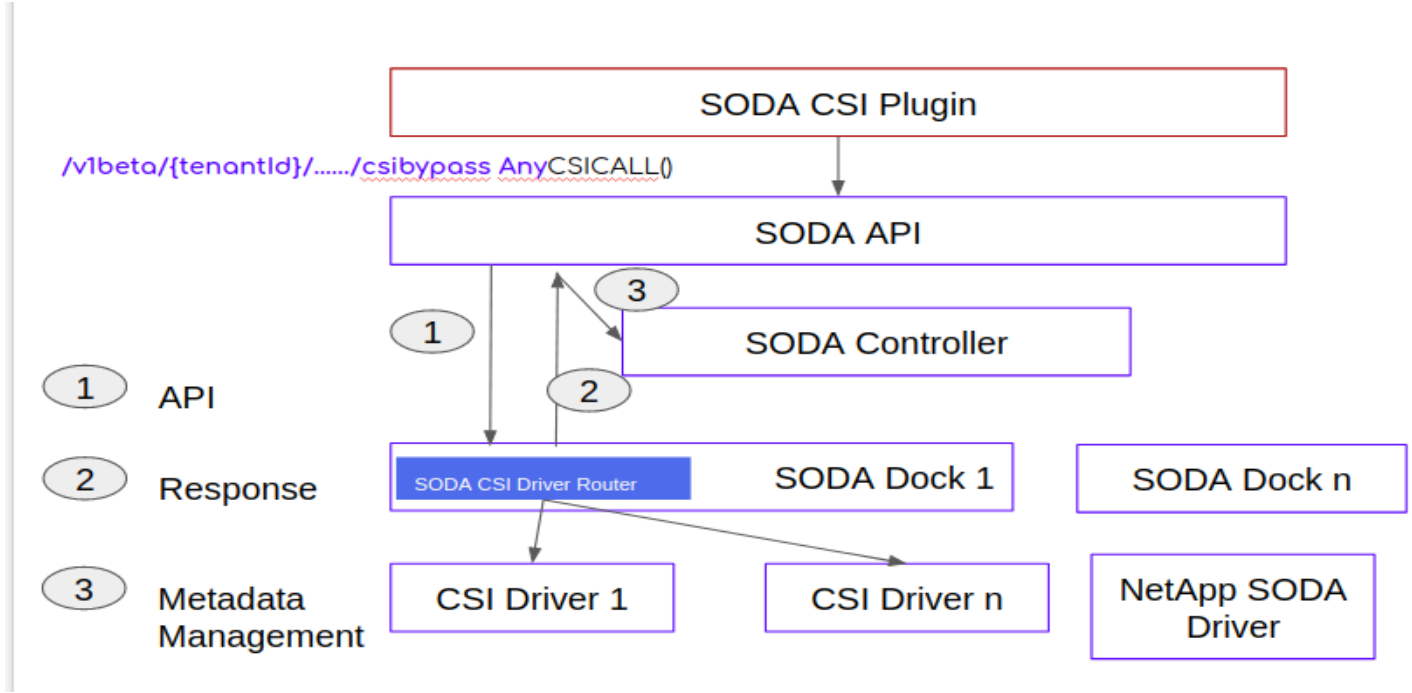


SODA Ecosystem and its CSI Plugin

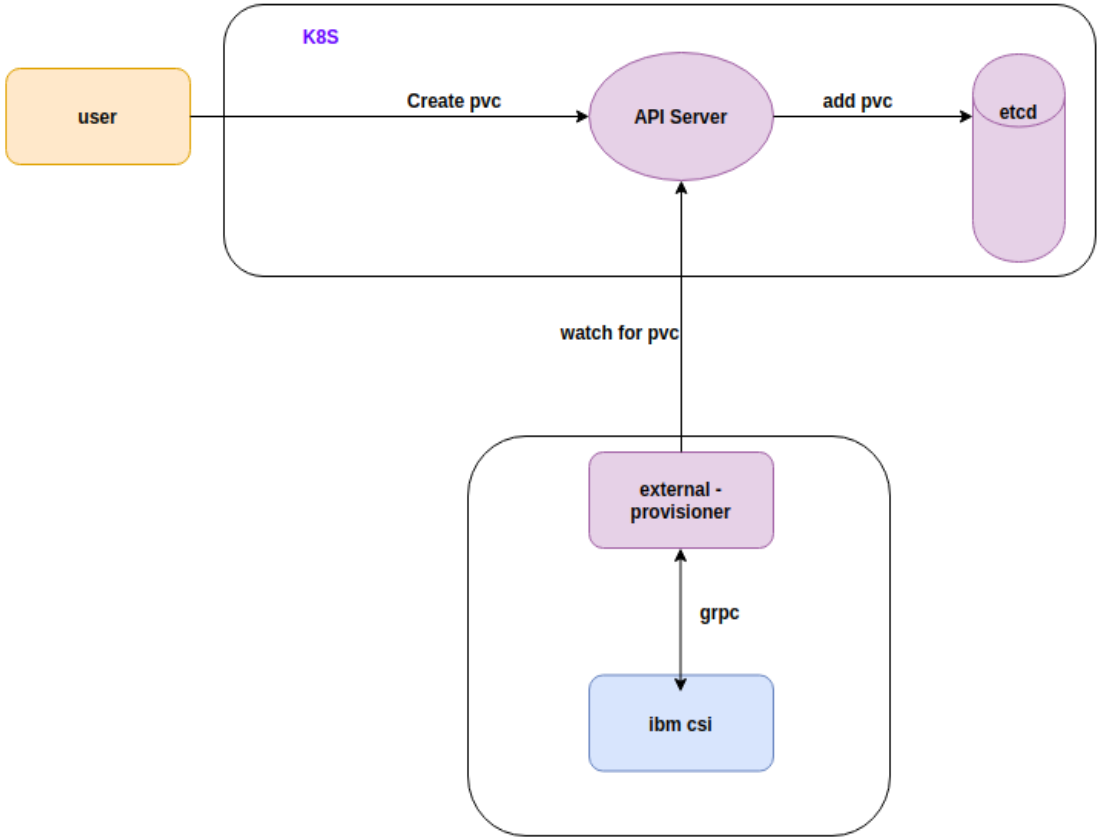


CSI PlugNPlay – One Plugin for heterogenous csi drivers

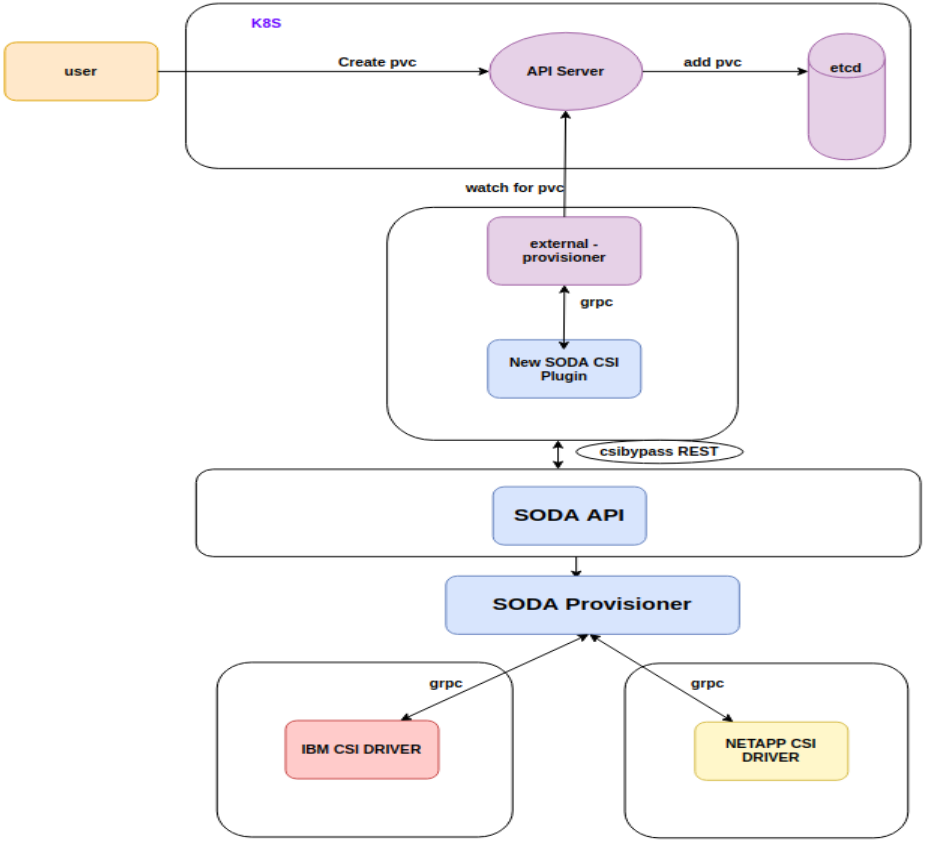
SODA-CSI Plug-N-Play (Design Option 1)



Normal volume provisioning flow for csi driver



Volume provisioning flow with PlugNPlay



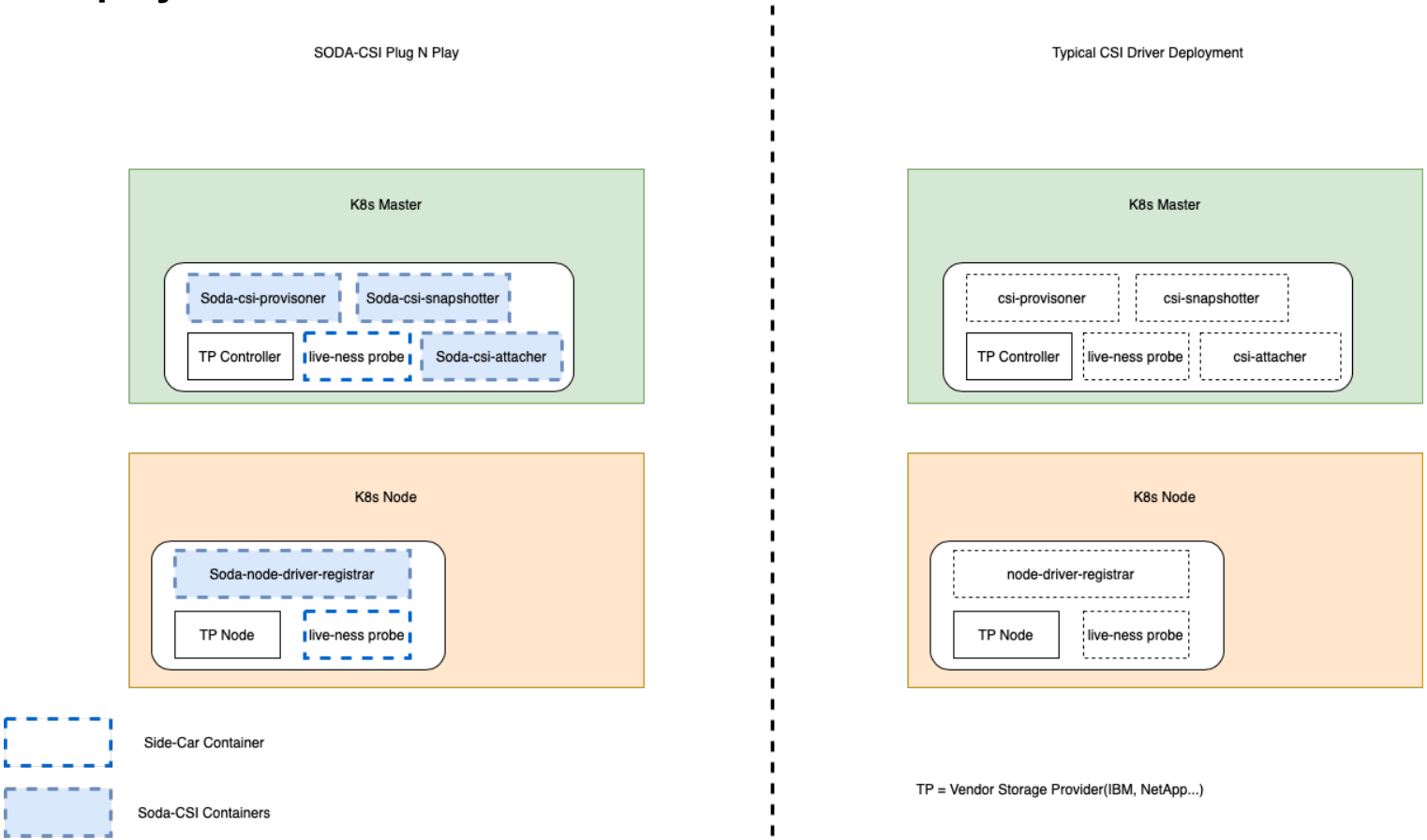
SODA-CSI Plug-N-Play (Design Option 2)

Goals

Make a single CSI Plug-N-Play mechanism which helps to:

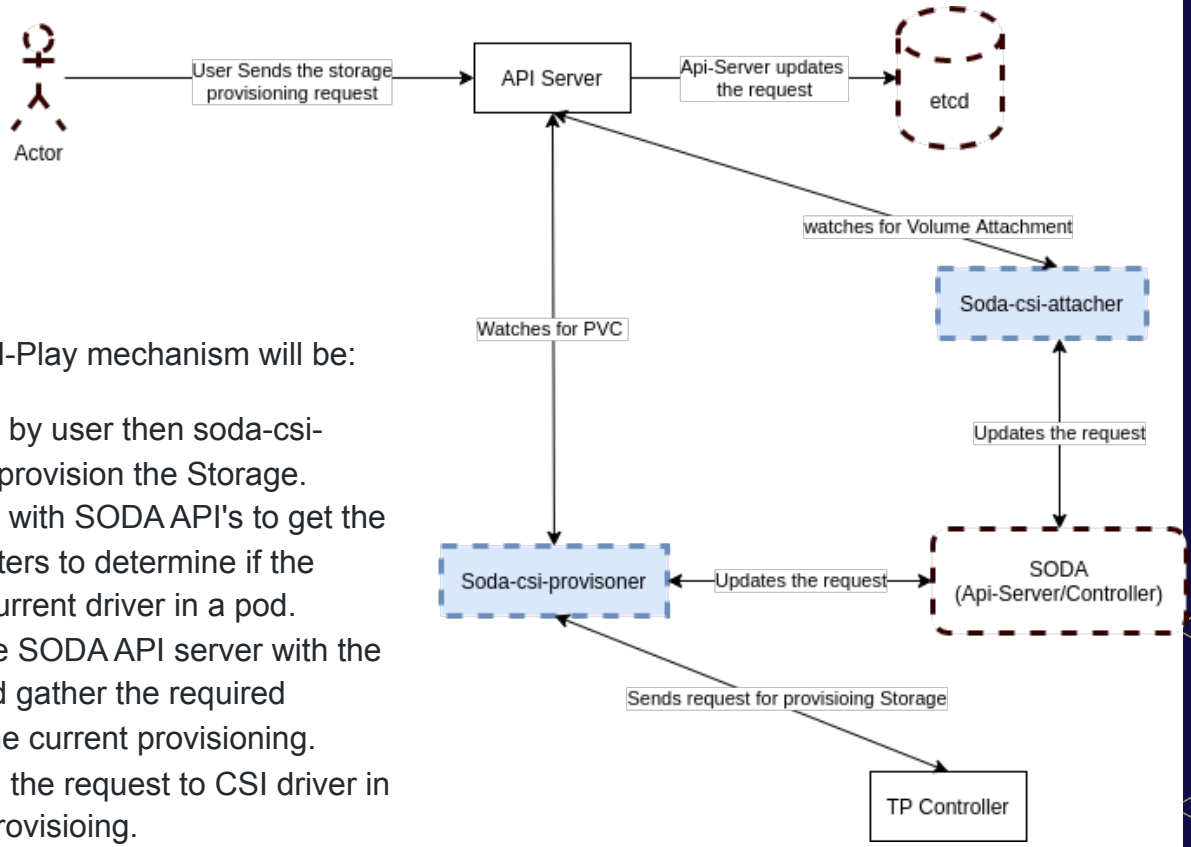
- Provision and manage the Storage of heterogeneous Storage providers.
- Third party CSI drivers should be used directly from Vendors so that SODA/Users need not worry about it's maintenance.
- Use Soda Profile ID to determine which storage vendor drivers need to be used to provision the storage.
- Experience all the features set of SODA.

Deployment View



Call Flows

```
apiVersion: storage.k8s.io/v1
kind: StorageClass
metadata:
 name: csi-soda-example--block
provisioner: csi-soda-block
parameters:
 attachMode: rw
 profile: XXXXXXXXXXXXXXXXXXXXXXXXXXXX
```



A typical call flow for SODA CSI Plug-N-Play mechanism will be:

- Once the PVC Object is created by user then soda-csi-provisioner will get a request to provision the Storage.
- soda-csi-provisioner will interact with SODA API's to get the profile details and other parameters to determine if the required driver is same as the current driver in a pod.
- soda-csi-provisioner updates the SODA API server with the volume provisioning request and gather the required intelligence from SODA about the current provisioning.
- soda-csi-provisioner will forward the request to CSI driver in the same pod to do the actual provisioing.

Demo

Design option 1:

Advantages

- **Different third party csi drivers under one management**
- **All SODA ecosystem features, provisionings can be leveraged for all csi drivers in use**

References

- **https://github.com/sodafoundation/nbp/tree/master/csi**
- **https://github.com/sodafoundation/design-specs/blob/master/specs/elba/CSIPlugNPlayDesign.md**
- **https://github.com/asifdxtreme/soda-csi-plugin/tree/master/doc**

Thank You