Unravelling the Mystery of Versioning CRDs

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About me

- Developer at Civo Cloud
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- Chess 💜

Why/When you need to upgrade CRD version

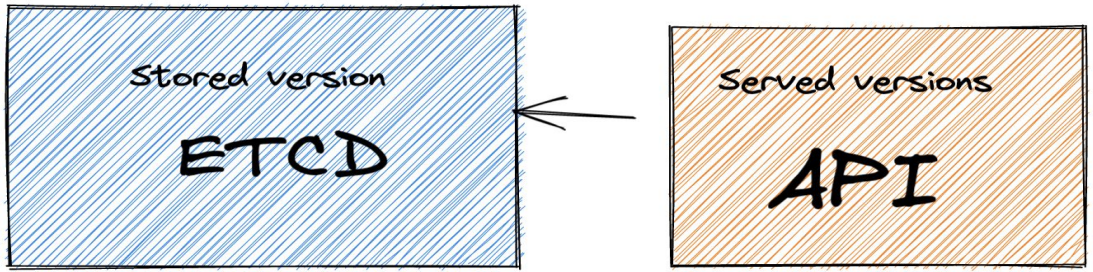
- Addition of required fields
- Change in Fields(Name/Type)
    - Simplifying user inputs
    - Evolution of API conventions

When you don’t need to upgrade

- Addition of optional fields
- Validations(which don’t break existing defaults)

Served vs Stored

- Served lets you control the view of the object in the particular version
- Stored lets you control which version of the object is persisted in etcd
- Only one version should always be set to Stored while the object can be Served(viewed/read by clients) in multiple versions

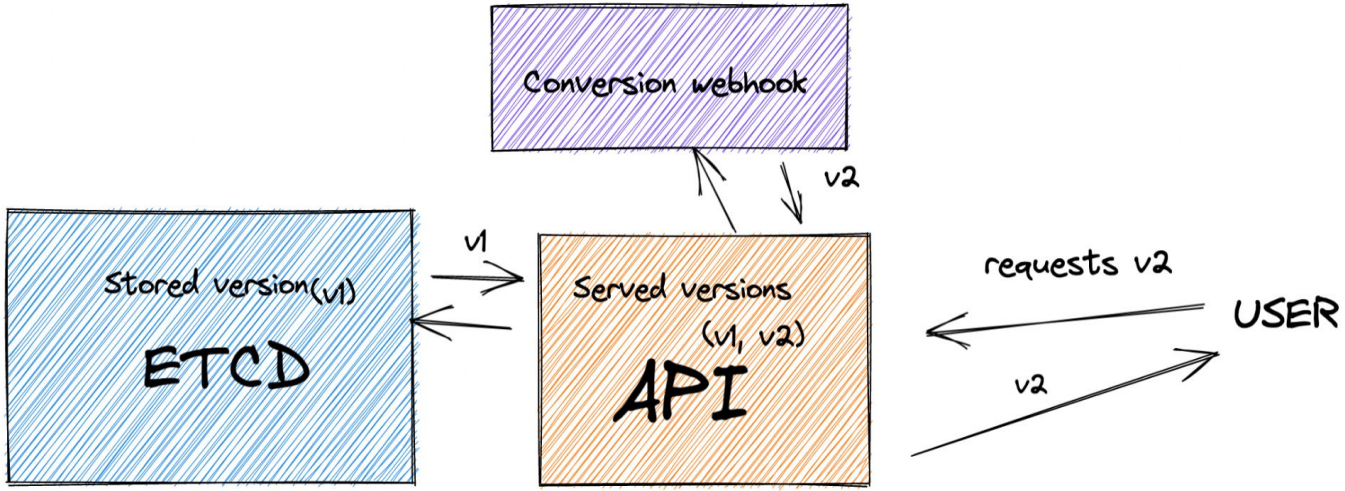


Conversion strategy

- Strategy None:
  - Only changes the API version.
  - Should be used when there are no schema changes

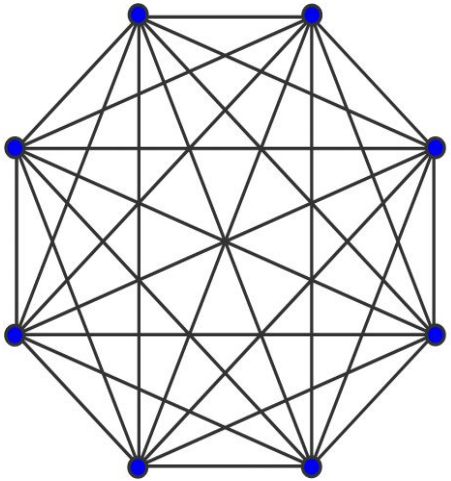
- Strategy Webhook

DEMO

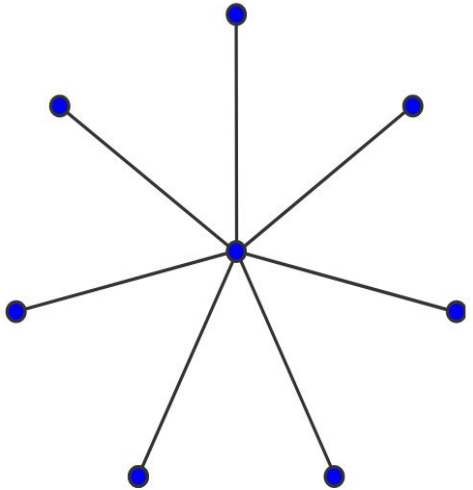

Conversion webhook
v2
v1
Stored version(v1)
ETCD
Served versions
(v1, v2)
API
requests v2
USER
v2

Conversion webhook

Hub and spoke model(from KB docs)

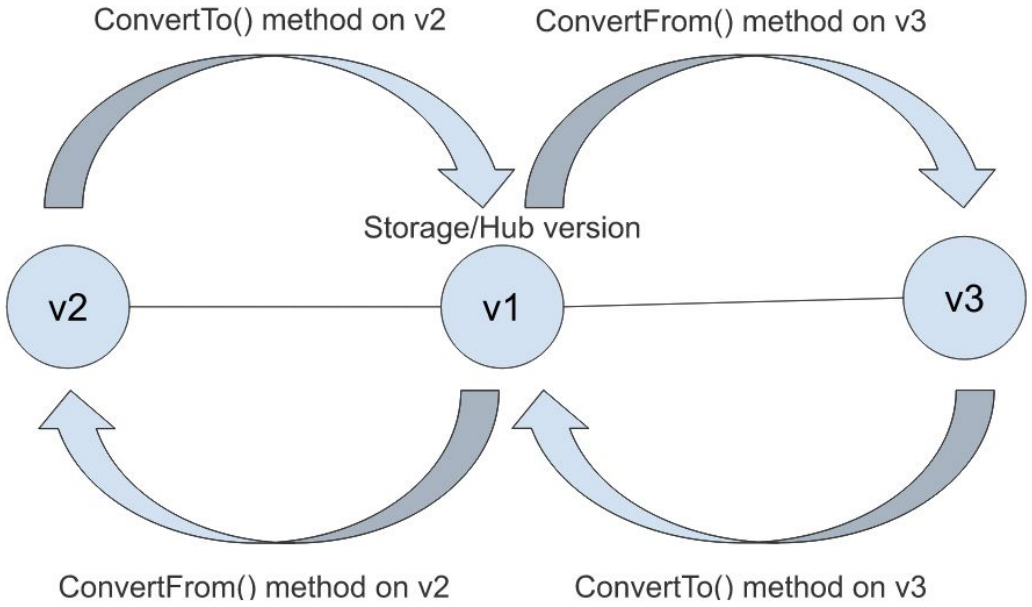


becomes



Conversion webhook(cont..)

Conversion in hub/spoke



Upgrading objects

1. Storage Version Migrator

- This tool migrates stored data in etcd to the latest storage version.

2. Custom program(or manually)

- Patch all objects so that objects are re-written to desired stored version.

Process of deprecating a version

1. Introduce a new version whilst the old version remains the stored version.

2. Set the newer version to be the stored version

3. Stop serving on the old version.

References

- https://book.kubebuilder.io/multiversion-tutorial/tutorial.html
- https://kubernetes.io/docs/tasks/extend-kubernetes/custom-resources/custom-resource-definition-versioning/
- DEMO: https://github.com/RealHarshThakur/crd-versioning-demo
- https://github.com/kubernetes-sigs/kube-storage-version-migrator
- For non-KB/Operator-sdk projects: https://github.com/madorn/crd-conversion-webhook

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