



# Kubernetes API with Custom Resource Definitions (CRD)



## Custom Resource Definitions (CRD)

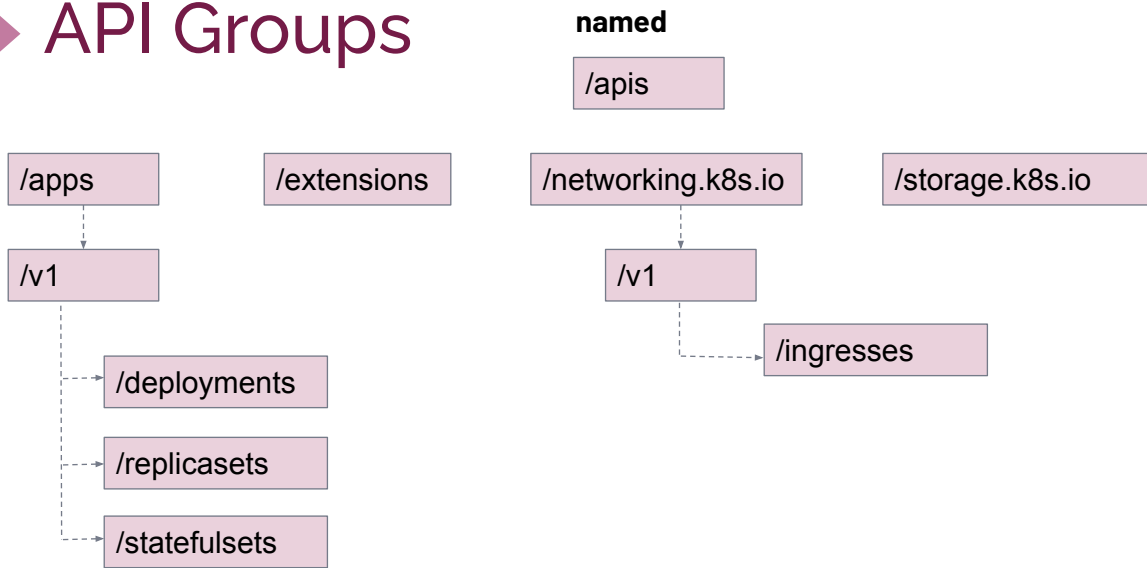


A **resource** is an **endpoint** in the Kubernetes API that stores a collection of API objects of a certain kind; for example, the built-in **pods** resource contains a collection of **Pod objects**.





# API Groups



## Custom Resource Definitions (CRD)

A **custom resource** is an extension of the Kubernetes API that is **not necessarily available in a default Kubernetes installation**. It represents a customization of a particular Kubernetes installation.

## Custom Resource Definitions (CRD)



```
apiVersion: "clarusway.io/v1"
kind: BookReservation
metadata:
  name: hotel-reservation
spec:
  hotel: "hotelclarus"
  date: "01.07.2023-31.07.2023"
  count: 40
```



```
kubectl apply -f myreservation.yaml
```

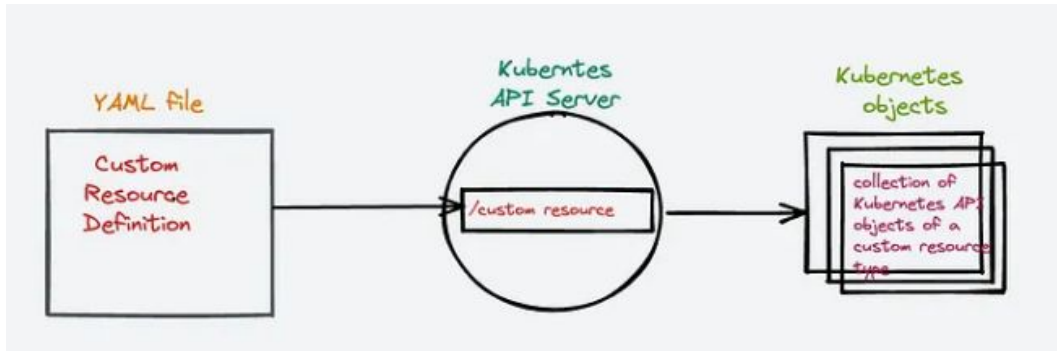
## Custom Resource Definitions (CRD)



Because of the extensibility of the Kubernetes API, **new resources called custom resources can be added to the Kubernetes API** in the form of API endpoints in order to allow the creation of custom objects of a particular custom resource type or kind

# Custom Resource Definitions (CRD)

**Custom resource definitions** are (templates) used to add new API endpoints or resources to the Kubernetes API



# Custom Resource Definitions (CRD)

```
apiVersion: apiextensions.k8s.io/v1
kind: CustomResourceDefinition
metadata:
  # name must match the spec fields below, and be in the form: <plural>.<group>
  name: bookreservations.clarusway.io
spec:
  # group name to use for REST API: /apis/<group>/<version>
  group: clarusway.io
  # list of versions supported by this CustomResourceDefinition
  versions:
    - name: v1
      # Each version can be enabled/disabled by Served flag.
      served: true
      # One and only one version must be marked as the storage version.
      storage: true
      schema:
        openAPIV3Schema:
          . . .
```

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# Custom Resource Definitions (CRD)



```
storage: true
schema:
  openAPIV3Schema:
    type: object
    properties:
      spec:
        type: object
        properties:
          hotel:
            type: string
          date:
            type: string
          count:
            type: integer
    ...
```

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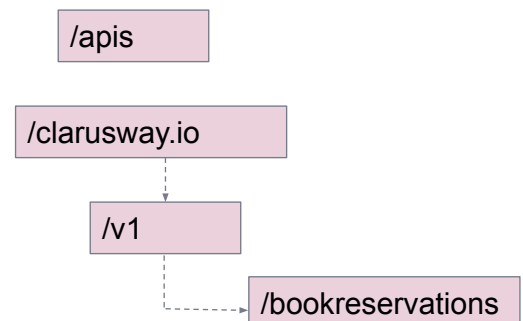
```
# either Namespaced or Cluster
scope: Namespaced
names:
  # plural name to be used in the URL:
  /apis/<group>/<version>/<plural>
  plural: bookreservations
  # singular name to be used as an alias on the CLI
  and for display
  singular: bookreservation
  # kind is normally the CamelCased singular type.
  Your resource manifests use this.
  kind: BookReservation
  # shortNames allow shorter string to match your
  resource on the CLI
  shortNames:
    - br
```

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## API Groups



- The **CustomResourceDefinition API resource** allows you to define custom resources.
- Defining a CRD object creates a new custom resource with a name and schema that you specify.



# Custom Controllers

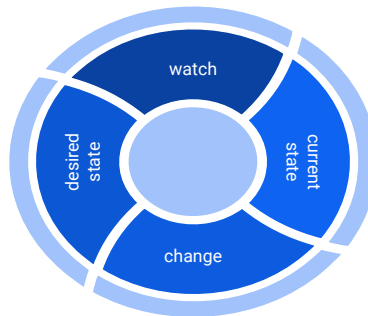
In Kubernetes, controllers are control loops that watch the state of your cluster, then make or request changes where needed. Each controller tries to move the current cluster state closer to the desired state.

## RESOURCES



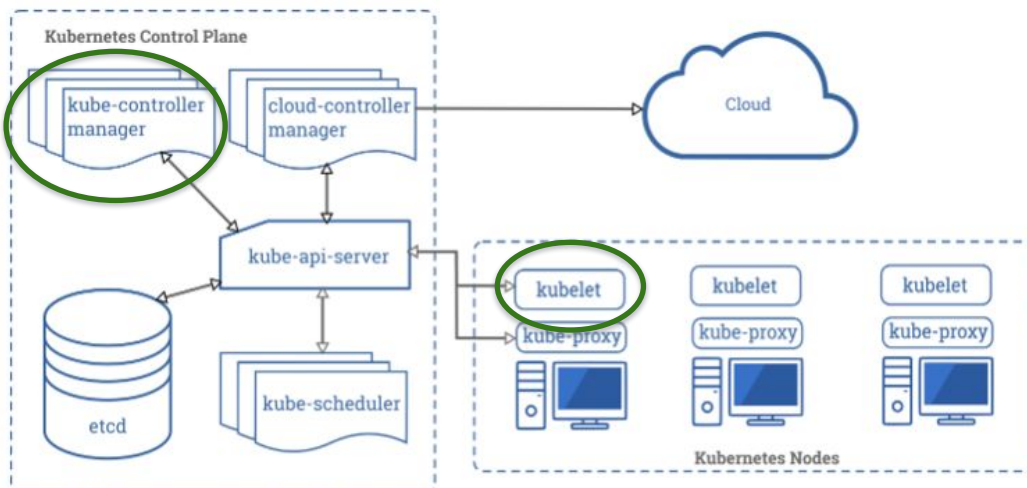
## CONTROLLER

Deployment  
Controller



# Custom Controllers

Monitors the cluster state via the apiserver and steers the cluster towards the desired state.

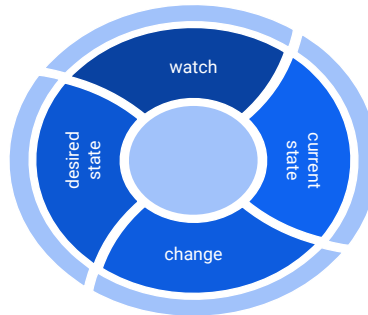


# Custom Controllers

On their own, custom resources let you store and retrieve structured data. When you combine a custom resource with a custom controller, custom resources provide a true declarative API.

## RESOURCES

Custom Resource



## CONTROLLER

Custom Controller

# THANKS!

## Any questions?

