

Kubebuilder 运行测试

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前置条件

K8s 环境

```
1 | anxin@node38:~$ kubectl cluster-info
2 | Kubernetes master is running at https://10.8.30.38:6443
3 | CoreDNS is running at https://10.8.30.38:6443/api/v1/namespaces/kube-
  | system/services/kube-dns:dns/proxy
4 | Metrics-server is running at https://10.8.30.38:6443/api/v1/namespaces/kube-
  | system/services/https:metrics-server:/proxy
5 |
6 | To further debug and diagnose cluster problems, use 'kubectl cluster-info
  | dump'.
```

go 环境

```
1 | anxin@node38:~$ go version
2 | go version go1.16.7 linux/amd64
```

kustomize 工具

```
1 | # 安装 kustomize: sudo snap install kustomize
2 | anxin@node38:~$ kustomize version
3 | {Version:kustomize/v4.1.3 GitCommit:0f614e92f72f1b938a9171b964d90b197ca8fb68
  | BuildDate:2021-05-20T20:52:40Z GoOs:linux GoArch:amd64}
```

运行测试

部署 CRD

```
1 anxin@node38:~/pengling/k8s/kubebuilder/guestbook$ make install
2 go: creating new go.mod: module tmp
3 go get: added sigs.k8s.io/controller-tools v0.2.5
4 /home/anxin/go/bin/controller-gen "crd:trivialVersions=true"
  rbac:roleName=manager-role webhook paths="./..."
  output:crd:artifacts:config=config/crd/bases
5 kustomize build config/crd | kubectl apply -f -
6 customresourcedefinition.apiextensions.k8s.io/guestbooks.webapp.my.domain
  created
7
8 # 查看已安装的 CRD
9 anxin@node38:~$ kubectl get crd | grep my.domain
10 guestbooks.webapp.my.domain      2021-10-14T03:36:27Z
```

部署 Controller (控制器)

有两种方式运行 controller:

- 本地运行, 用于调试。
- 部署到 Kubernetes 上运行, 作为生产使用。

本文采用 本地运行 方式: 执行 `make run` 命令即可。将看到 controller 启动和运行时输出。

```
1 anxin@node38:~/pengling/k8s/kubebuilder/guestbook$ make run
2 go: creating new go.mod: module tmp
3 go get: added sigs.k8s.io/controller-tools v0.2.5
4 /home/anxin/go/bin/controller-gen
  object:headerFile="hack/boilerplate.go.txt" paths="./..."
5 go fmt ./...
6 main.go
7 go vet ./...
8 go: downloading github.com/onsi/ginkgo v1.11.0
9 go: downloading github.com/onsi/gomega v1.8.1
10 go: downloading golang.org/x/xerrors v0.0.0-20190717185122-a985d3407aa7
11 go: downloading github.com/hpccloud/tail v1.0.0
12 go: downloading gopkg.in/tomb.v1 v1.0.0-20141024135613-dd632973f1e7
13 /home/anxin/go/bin/controller-gen "crd:trivialVersions=true"
  rbac:roleName=manager-role webhook paths="./..."
  output:crd:artifacts:config=config/crd/bases
14 go run ./main.go
15 2021-10-14T21:17:50.085+0800 INFO controller-runtime.metrics metrics
  server is starting to listen {"addr": ":8080"}
16 2021-10-14T21:17:50.086+0800 INFO setup starting manager
17 2021-10-14T21:17:50.086+0800 INFO controller-runtime.manager starting
  metrics server {"path": "/metrics"}
18 2021-10-14T21:17:50.086+0800 INFO controller-runtime.controller
  Starting EventSource {"controller": "guestbook", "source": "kind source:
  /, Kind="}
19 2021-10-14T21:17:50.187+0800 INFO controller-runtime.controller
  Starting Controller {"controller": "guestbook"}
```

```
20 2021-10-14T21:17:50.187+0800 INFO controller-runtime.controller
Starting workers {"controller": "guestbook", "worker count": 1}
21
```

部署 CR

Kubebuilder 在 初始化项目 时，如果你按了 `y` 创建资源 [y/n]，那么你就为示例中的 CRD 创建了一个自定义资源 CR。

```
1 anxin@node38:~/pengling/k8s/kubebuilder/guestbook$ kubectl apply -f
config/samples/
2 guestbook.webapp.my.domain/guestbook-sample created
```

执行下面的命令查看新创建的 CR。

```
1 # 查看 CRD 资源 (CRD_NAME)
2 anxin@node38:~/pengling/k8s/kubebuilder/guestbook$ kubectl get crd | grep
my.domain
3 guestbooks.webapp.my.domain          2021-10-15T23:07:47Z
4
5 # 查看 CR 资源 (CR_NAME)
6 anxin@node38:~$ kubectl get guestbooks.webapp.my.domain
7 NAME                                AGE
8 guestbook-sample                    4h16m
9
10 # 查看新创建的 CR 实例: guestbook-sample
11 anxin@node38:~$ kubectl get guestbooks.webapp.my.domain guestbook-sample -o
yaml
12 apiVersion: webapp.my.domain/v1
13 kind: Guestbook
14 metadata:
15   annotations:
16     kubectl.kubernetes.io/last-applied-configuration: |
17       {"apiVersion":"webapp.my.domain/v1","kind":"Guestbook","metadata":
{"annotations":{},"name":"guestbook-sample","namespace":"default"},"spec":
{"foo":"bar"}}
18   creationTimestamp: "2021-10-15T07:40:42Z"
19   generation: 1
20   managedFields:
21     - apiVersion: webapp.my.domain/v1
22       fieldsType: FieldsV1
23       fieldsV1:
24         f:metadata:
25           f:annotations:
26             .: {}
27           f:kubectl.kubernetes.io/last-applied-configuration: {}
28         f:spec:
29           .: {}
30           f:foo: {}
31       manager: kubectl
32       operation: Update
33       time: "2021-10-15T07:40:42Z"
34   name: guestbook-sample
35   namespace: default
36   resourceVersion: "124058534"
```

```
37 | selfLink:
    | /apis/webapp.my.domain/v1/namespaces/default/guestbooks/guestbook-sample
38 |   uid: ec030094-7d91-4c7c-9b03-6a2fe9acbc0b
39 | spec:
40 |   foo: bar
```

其中，输出的最后部分正是我们在 CRD 里定义的字段。

```
1 | spec:
2 |   foo: bar
```

卸载资源

删除 CR

```
1 | anxin@node38:~$ kubectl delete guestbooks.webapp.my.domain guestbook-sample
2 | guestbook.webapp.my.domain "guestbook-sample" deleted
```

卸载 CRD

```
1 | anxin@node38:~/pengling/k8s/kubebuilder/guestbook$ make uninstall
2 | go: creating new go.mod: module tmp
3 | go get: added sigs.k8s.io/controller-tools v0.2.5
4 | /home/anxin/go/bin/controller-gen "crd:trivialVersions=true"
   | rbac:roleName=manager-role webhook paths="./..."
   | output:crd:artifacts:config=config/crd/bases
5 | kustomize build config/crd | kubectl delete -f -
6 | customresourcedefinition.apiextensions.k8s.io "guestbooks.webapp.my.domain"
   | deleted
```

卸载 Controller

```
1 | anxin@node38:~/pengling/k8s/kubebuilder/guestbook$ make undeploy
2 | make: *** No rule to make target 'undeploy'. Stop.
```

Troubleshooting

执行 `make install` 安装 CRD 失败: <https://proxy.golang.org> 请求超时, 设置国内代理解决。

```
1 # https://proxy.golang.org 访问超时
2 anxin@node38:~/pengling/k8s/kubebuilder/guestbook$ make install
3 go: creating new go.mod: module tmp
4 go get: sigs.k8s.io/controller-tools/cmd/controller-gen@v0.2.5: Get
  "https://proxy.golang.org/sigs.k8s.io/controller-tools/cmd/controller-
  gen/@v/v0.2.5.info": dial tcp 142.251.42.241:443: i/o timeout
5 Makefile:69: recipe for target 'controller-gen' failed
6 make: *** [controller-gen] Error 1
7
8 # 设置国内代理: https://goproxy.cn
9 anxin@node38:~$ go env GOPROXY
10 https://goproxy.cn,https://proxy.golang.org,direct
```