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Kanary

Automated and integrated canary testing using CRD and an operator

Who we are



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David Benque

dbenque@amadeus.com



Expert PaaS, Software Engineer

Cedric Lamoriniere

cedric.lamoriniere@datadoghq.com



Open-Source Software Engineer
Container Ecosystems

Canary deployment in kubernetes



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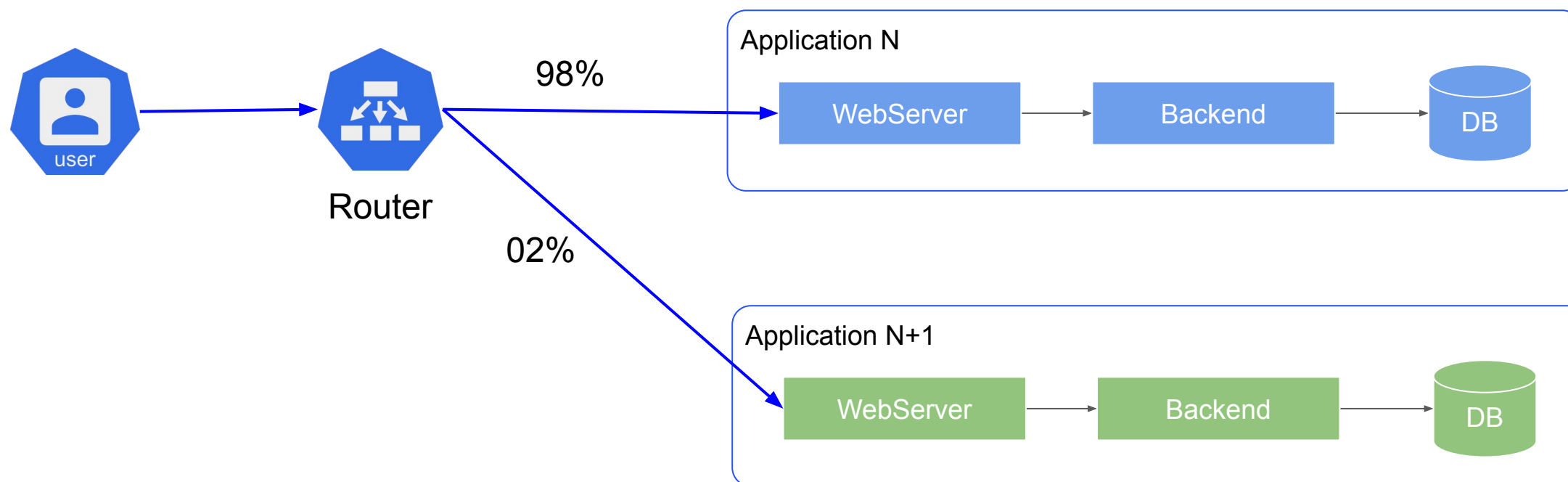


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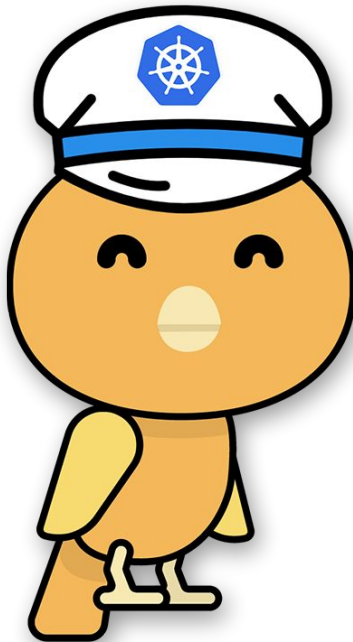
Canary Deployment is a technique to reduce the risk of introducing a new software version in production by slowly rolling out the change to a small subset of users before rolling it out to the entire infrastructure and making it available to everybody.





How do you do your canary testing today?

- Homemade scripts? Spinnaker? JenkinsFile and pipelines?



With Canary:

- K8s native solution
- A unique interface with the system
- Scheduled
- Preserve Deployment history
- Allow parallel canary deployments

Canary deployment in kubernetes



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- **Canary scale:** fix replicas | HorizontalPodAutoscaling | % replicas
- **Traffic management:** no traffic | % of live traffic | test traffic | both
istio: [tagged traffic | shadow traffic]
- **Validation:** manual | labelwatch | promql | custom | metrics-server
- **Application update:** dry-run | automatic rolling-update

Canary deployment in kubernetes



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```
apiVersion: kanary.k8s.io/v1alpha1
kind: CanaryDeployment
metadata:
  name: myapp
spec:
  deploymentName: myapp
  serviceName: myapp-svc
  scale:
    static:
      replicas: 1
  traffic:
    source: both
  validation:
    validationPeriod: 15m
    items:
      - manual:
          statusAfterDeadline: # valid
          status: # valid
  template:
    # deployment template
```

```
validations:
  initialDelay: 20s
  items:
    - promQL:
        allPodsQuery: true
        podNamekey: pod
        prometheusService: prometheus:9090
        query: "histogram_quantile(0.99, ...) by (le)"
        valueInRange:
          max: 0.31
          min: 0
    maxIntervalPeriod: 10s
    validationPeriod: 1m0s
```

Kanary presentation and advantages

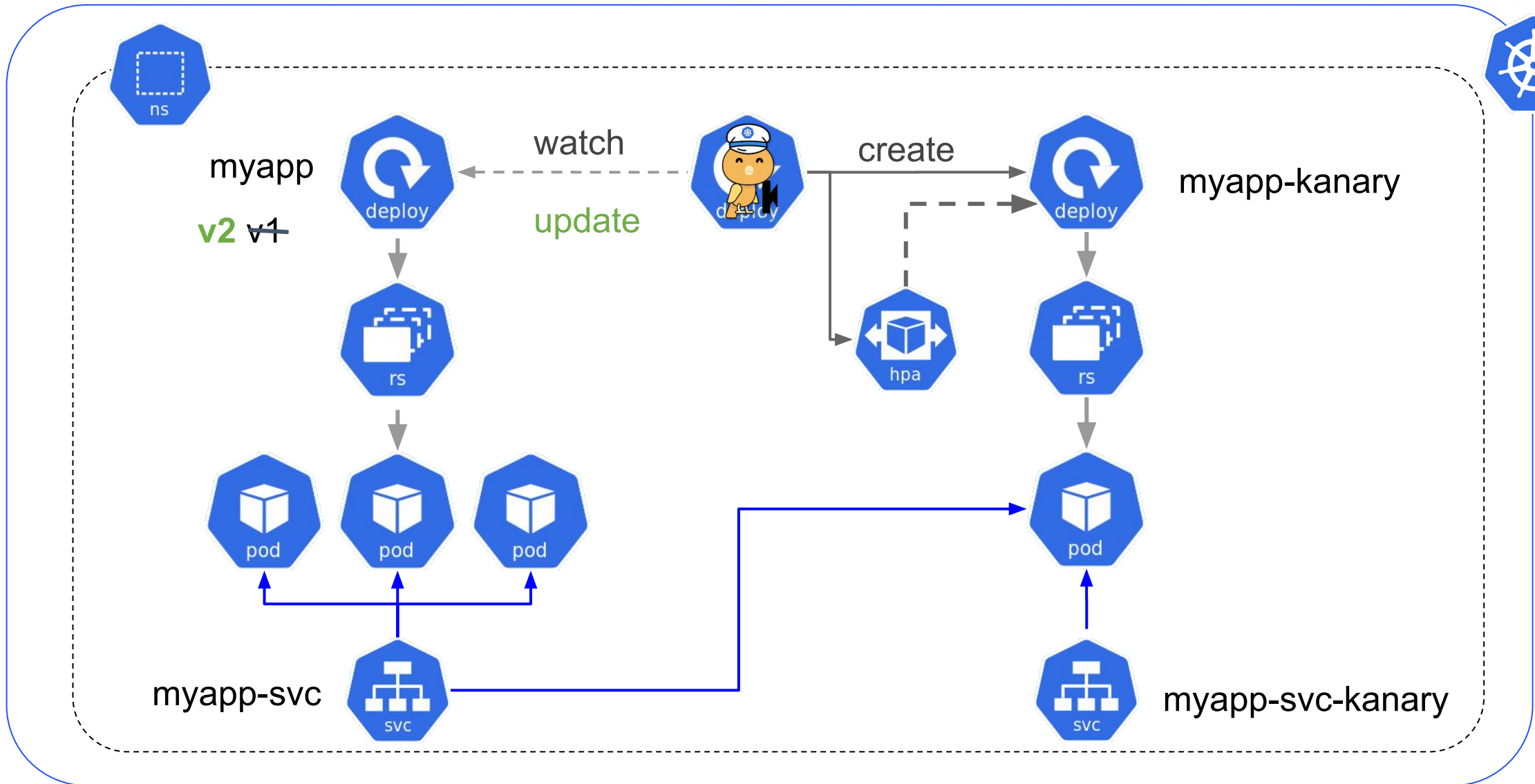


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Demo



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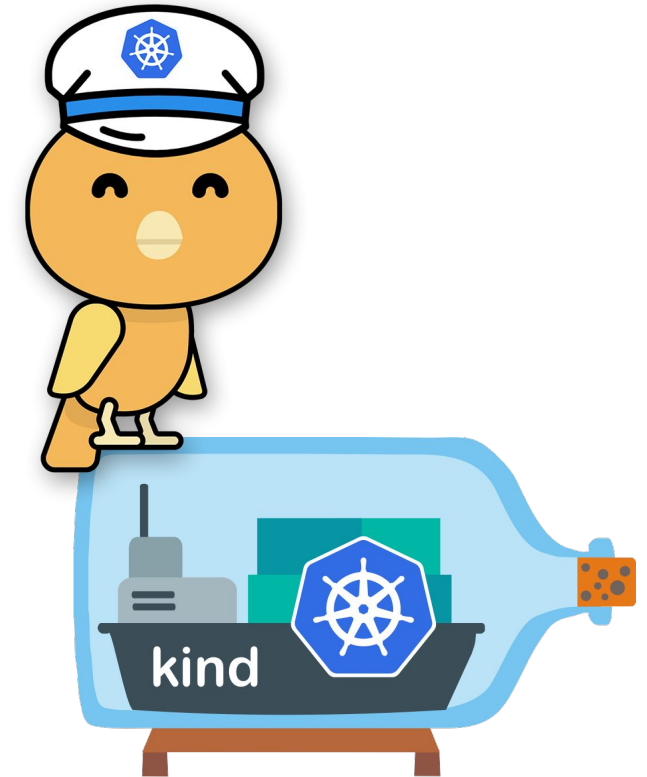


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KEEP CALM IT'S DEMO TIME



Demo



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`kubectl kanary generate`
then
`kubectl apply -f kd.yaml`

KanaryDeployment

Scheduled

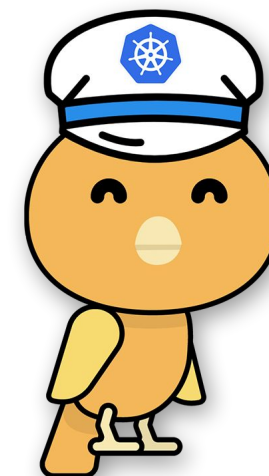
Validation Running

Succeeded

Failed

DeploymentUpdated

Dry-run



Kanary
Operator

How we build it



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OPERATOR
SDK

- **Speeds up the development solution**
 - bootstrap project
 - focus on operator logic
 - simplify testing
- **Missing features (yet)**
 - Custom Resource validation [#1217](#)
 - Custom Resource version conversion [#?](#)

How we build it



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```
$ mkdir -p $GOPATH/src/github.com/amadeusitgroup/ && cd ...
```

```
$ operator-sdk new kanary && cd kanary
```

```
$ operator-sdk add api --api-version=kanary.k8s.io/v1alpha1  
--kind=KanaryDeployment
```

```
$ operator-sdk add controller  
--api-version=kanary.k8s.io/v1alpha1 --kind=KanaryDeployment
```

Operator skeleton: Reconcile



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```
func (r *ReconcileKanaryDeployment) Reconcile(request reconcile.Request)
(reconcile.Result, error) {
    reqLogger := log.WithValues("Ns", request.Namespace, "KD", request.Name)
    reqLogger.Info("Reconciling KanaryDeployment")

    instance := &kanaryv1alpha1.KanaryDeployment{}
    err := r.client.Get(context.TODO(), request.NamespacedName, instance)

    // ----- Build your logic here ----- //
    // ...

    return reconcile.Result{}, nil
}
```

Operator-sdk: some traps



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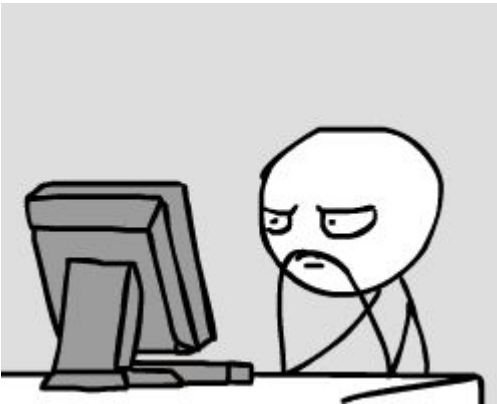
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**OPERATOR
SDK**

- Status Sub-Resource, behaviour change between k8s version (v1.10)
- Invalid Custom Resource skipped
- Log level support



Operator-sdk: some tips



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- For istio users, a controller usually do not expose services, so:

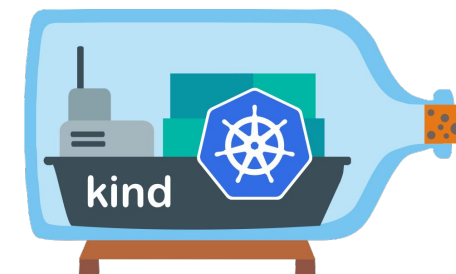
`annotations:`

`sidecar.istio.io/inject: "false"`

- For e2e test using KinD, doing traffic injection:
kubectl proxy + api master proxy api

`"http://127.0.0.1:8001/api/v1/namespaces/e2e-ns/services/http:prometheus:9091/proxy"`

- For demos using KinD, doing traffic injection:
kubectl port-forward + ingress



Summary



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- Canary Operator is ready for testing
- Future improvements:
 - Custom Metrics server support
 - Daemonset Canary testing
 - Istio routing features for Traffic spec
 - What do you need? Want to contribute?

Link: github.com/AmadeusItGroup/kanary

Summary



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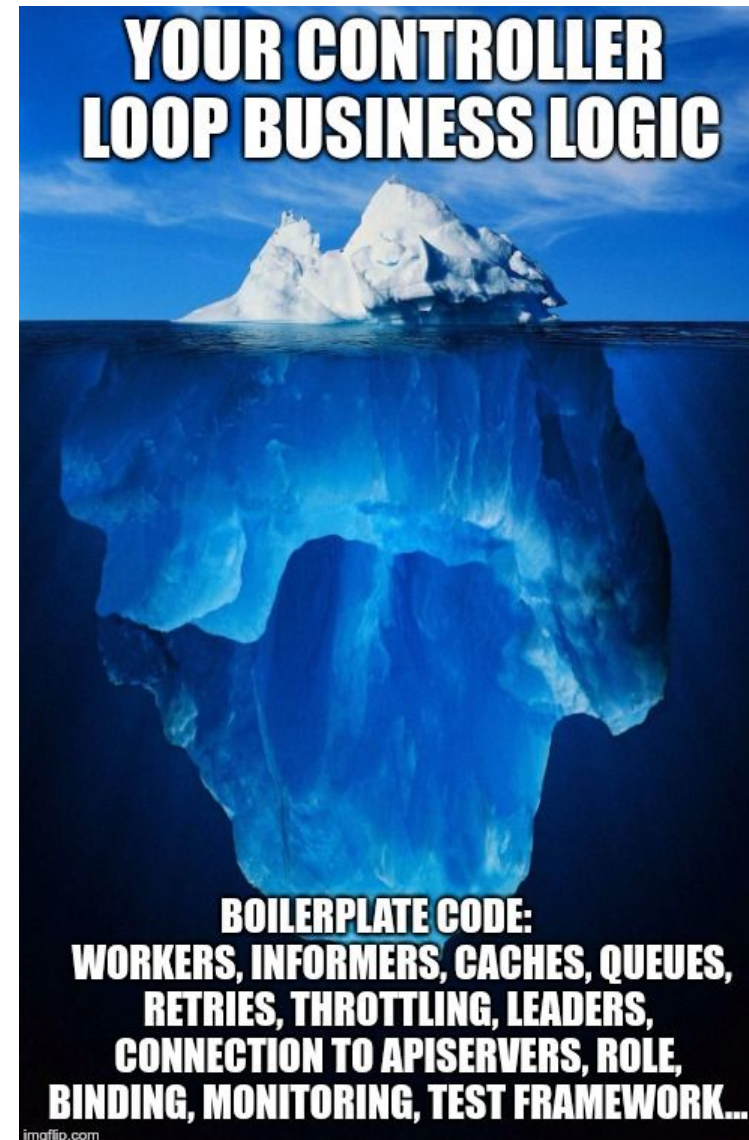


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- It has never been so easy to create an Operator





Question ?

Link: github.com/AmadeusItGroup/kanary

