Extending Deployment for Internet Financial Mission-Critical Scenarios

Ke Wu, Mengyi Zhou
CafeDeployment

- In-Place upgrade
  - Stable Pod IPs
- Safe and flexible deployment strategy
  - Canary deployment
  - Rolling upgrade in batches
- High availability in financial scenarios
  - Active-Active replication
  - Graceful shutdown of Pods
<table>
<thead>
<tr>
<th>Features</th>
<th>CafeDeployment</th>
<th>Deployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-place upgrade</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Canary</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Rolling upgrade strategy</td>
<td>Using Batches</td>
<td>Using max surge</td>
</tr>
<tr>
<td>Scaling strategy</td>
<td>Using Batches</td>
<td>N</td>
</tr>
<tr>
<td>Graceful shutdown of Pods</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Controller revision</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Pod scheduling policy</td>
<td>Deploy unit spread Node affinity</td>
<td>Node affinity</td>
</tr>
</tbody>
</table>
kind: CafeDeployment
spec:
podSetType: InPlaceSet
replicas: 6
matchLabels:
  instance: productpage
  name: bookinfo
... 
template:
  ...
topology:
  unitType: Cell
values:
  - CellA
  - CellB
unitReplicas:
  CellA: 3

kind: InPlaceSet
spec:
  minReadySeconds: 30
  replicas: 3
  selector:
    matchLabels:
      instance: productpage
      name: bookinfo
deployUnit: CellB
template:
  ...

In-Place Upgrade
**Deployment Strategy**

**InPlaceSetController**

**CafeDeploymentController**

Replica/Partition Allocator

**InPlaceSet A**

- Pod A-1
- Pod A-2
- Pod A-3
- Pod A-4

**InPlaceSet B**

- Pod B-1
- Pod B-2
- Pod B-3
- Pod B-4
- Pod B-5
- Pod B-6

**Beta Group**

- 1st Group
- 2nd Group

**Pod Upgrade**

---

kind: CafeDeployment

spec:

- podSetType: InPlaceSet
- replicas: 10

strategy:

- upgradeType: Beta
- batchSize: 4
- needWaitingForConfirm: true
Rescheduler

- Enable auto-rescheduling Pod to another InPlaceSet when out of node resources in one deploy unit.
Multi Workload Adapted

kind: CafeDeployment
spec:
podSetType: ReplicaSet
replicas: 10
strategy:
  upgradeType: Beta
  batchSize: 4
  needWaitingForConfirm: true
High Availability

- Even spread of Pods across deploy units
- Strict readiness management during upgrade
- Third-party controller cooperation
Now it’s DEMO time!