

TESTS TO EXERCISE AND EVALUATE CI/CD

1. ArgoCD redeploys when container is updated

Looking at the status.history of the yaml file, it is possible to see that the deploys are being carried out, as shown below:

```
90 status: ""
91 health:
92   status: Healthy
93 history:
94 - deployStartedAt: "2022-06-22T12:14:12Z"
95   deployedAt: "2022-06-22T12:14:16Z"
96   id: 0
97   revision: 06dbff94ce3d3dbfbad21d1567eea833738cb772
98   source:
99     path: kubernetes
100    repoURL: https://github.com/aikaterhine/american-predictor
101 - deployStartedAt: "2022-06-24T18:56:10Z"
102   deployedAt: "2022-06-24T18:56:15Z"
103   id: 1
104   revision: 6f0f2b59d3df90e4079af4e59b2fb015bebb3511
105   source:
106     path: kubernetes
107    repoURL: https://github.com/aikaterhine/american-predictor
108 - deployStartedAt: "2022-06-24T19:11:19Z"
109   deployedAt: "2022-06-24T19:11:24Z"
110   id: 2
111   revision: 6f0f2b59d3df90e4079af4e59b2fb015bebb3511
112   source:
113     path: kubernetes
114    repoURL: https://github.com/aikaterhine/american-predictor
115 - deployStartedAt: "2022-06-24T19:11:38Z"
116   deployedAt: "2022-06-24T19:11:38Z"
117   id: 3
118   revision: 6f0f2b59d3df90e4079af4e59b2fb015bebb3511
119   source:
120     path: kubernetes
121    repoURL: https://github.com/aikaterhine/american-predictor
122 - deployStartedAt: "2022-06-24T19:24:22Z"
123   deployedAt: "2022-06-24T19:24:26Z"
124   id: 4
125   revision: 6f0f2b59d3df90e4079af4e59b2fb015bebb3511
126   source:
127     path: kubernetes
128    repoURL: https://github.com/aikaterhine/american-predictor
129 - deployStartedAt: "2022-06-24T19:25:03Z"
130   deployedAt: "2022-06-24T19:25:03Z"
131   id: 5
132   revision: 6f0f2b59d3df90e4079af4e59b2fb015bebb3511
133   source:
134     path: kubernetes
135    repoURL: https://github.com/aikaterhine/american-predictor
```

```
136 - deployStartedAt: "2022-06-24T19:35:02Z"
137   deployedAt: "2022-06-24T19:35:08Z"
138   id: 6
139   revision: 504f2424b4aeada5cb93a9fb24d969bbb8bda5b0
140   source:
141     path: kubernetes
142    repoURL: https://github.com/aikaterhine/american-predictor
143 - deployStartedAt: "2022-06-24T19:36:35Z"
144   deployedAt: "2022-06-24T19:36:36Z"
145   id: 7
146   revision: 504f2424b4aeada5cb93a9fb24d969bbb8bda5b0
147   source:
148     path: kubernetes
149    repoURL: https://github.com/aikaterhine/american-predictor
150 - deployStartedAt: "2022-06-24T19:47:18Z"
151   deployedAt: "2022-06-24T19:47:23Z"
152   id: 8
153   revision: b5f8fa45570806d0c28018358736a77233a1ad53
154   source:
155     path: kubernetes
156    repoURL: https://github.com/aikaterhine/american-predictor
157 operationState:
158   finishedAt: "2022-06-24T19:47:23Z"
159   message: successfully synced (all tasks run)
160   operation:
161     initiatedBy:
162       automated: true
163     retry:
164       limit: 5
165     sync:
166       revision: b5f8fa45570806d0c28018358736a77233a1ad53
167   phase: Succeeded
168   startedAt: "2022-06-24T19:47:18Z"
169   syncResult:
170     resources:
171       - group: ""
172         hookPhase: Running
173         kind: Service
174         message: service/american-predictor-service unchanged
175         name: american-predictor-service
176         namespace: catarinapereira
177         status: Synced
178         syncPhase: Sync
179         version: v1
180       - group: apps
181         hookPhase: Running
182         kind: Deployment
```

With the update of the container "catarinaedp/american-predictor" from the tag "v2.0.9" to the tag "v2.0.10", ArgoCD performed the deployment and replaced the image, as can be seen below.

```

151 operationState:
152   finishedAt: "2022-06-24T19:36:36Z"
153   message: successfully synced (all tasks run)
154   operation:
155     initiatedBy:
156       username: catarinapereira
157     retry: {}
158     sync:
159       revision: 504f2424b4aeada5cb93a9fb24d969bbb8bda5b0
160       syncStrategy:
161         hooks: {}
162   phase: Succeeded
163   startedAt: "2022-06-24T19:36:35Z"
164   syncResults:
165     resources:
166     - group: ""
167       hookPhase: Running
168       kind: Service
169       message: service/american-predictor-service unchanged
170       name: american-predictor-service
171       namespace: catarinapereira
172       status: Synced
173       syncPhase: Sync
174       version: v1
175     - group: apps
176       hookPhase: Running
177       kind: Deployment
178       message: deployment.apps/american-predictor-deployment unchanged
179       name: american-predictor-deployment
180       namespace: catarinapereira
181       status: Synced
182       syncPhase: Sync
183       version: v1
184       revision: 504f2424b4aeada5cb93a9fb24d969bbb8bda5b0
185     source:
186       path: kubernetes
187       repoURL: https://github.com/aikaterhine/american-predictor
188   reconciledAt: "2022-06-24T19:36:36Z"
189   resources:
190   - health:
191     status: Healthy
192     kind: Service
193     name: american-predictor-service
194     namespace: catarinapereira
195     status: Synced

```

image catarinaedp/american-predictor:v2.0.9

```

196   version: v1
197   - group: apps
198   health:
199     status: Healthy
200   kind: Deployment
201   name: american-predictor-deployment
202   namespace: catarinapereira
203   status: Synced
204   version: v1
205   sourceType: Directory
206   summary:
207     images:
208     - catarinaedp/american-predictor:v2.0.9
209   sync:
210     comparedTo:
211       destination:
212         namespace: catarinapereira
213         server: https://kubernetes.default.svc
214       source:
215         path: kubernetes
216         repoURL: https://github.com/aikaterhine/american-predictor
217       revision: 504f2424b4aeada5cb93a9fb24d969bbb8bda5b0
218       status: Synced
219

```

```

157 operationState:
158   finishedAt: "2022-06-24T19:47:23Z"
159   message: successfully synced (all tasks run)
160   operation:
161     initiatedBy:
162       automated: true
163     retry:
164       limit: 5
165     sync:
166       revision: b5f8fa45570806d0c28018358736a77233a1ad53
167   phase: Succeeded
168   startedAt: "2022-06-24T19:47:18Z"
169   syncResults:
170     resources:
171     - group: ""
172       hookPhase: Running
173       kind: Service
174       message: service/american-predictor-service unchanged
175       name: american-predictor-service
176       namespace: catarinapereira
177       status: Synced
178       syncPhase: Sync
179       version: v1
180     - group: apps
181       hookPhase: Running
182       kind: Deployment
183       message: deployment.apps/american-predictor-deployment configured
184       name: american-predictor-deployment
185       namespace: catarinapereira
186       status: Synced
187       syncPhase: Sync
188       version: v1
189       revision: b5f8fa45570806d0c28018358736a77233a1ad53
190     source:
191       path: kubernetes
192       repoURL: https://github.com/aikaterhine/american-predictor
193   reconciledAt: "2022-06-25T15:05:18Z"
194   resources:
195   - health:
196     status: Healthy
197     kind: Service
198     name: american-predictor-service
199     namespace: catarinapereira
200     status: Synced

```

image catarinaedp/american-predictor:v2.0.10

```

201   version: v1
202   - group: apps
203   health:
204     status: Healthy
205   kind: Deployment
206   name: american-predictor-deployment
207   namespace: catarinapereira
208   status: Synced
209   version: v1
210   sourceType: Directory
211   summary:
212     images:
213     - catarinaedp/american-predictor:v2.0.10
214   sync:
215     comparedTo:
216       destination:
217         namespace: catarinapereira
218         server: https://kubernetes.default.svc
219       source:
220         path: kubernetes
221         repoURL: https://github.com/aikaterhine/american-predictor
222       revision: b5f8fa45570806d0c28018358736a77233a1ad53
223       status: Synced
224

```

2. How long the CI/CD pipeline takes to run by issuing requests using the client and checking for the update in the server's responses.

A request using wget was made on the client `http://10.224.0.14:5006/api/american` at "2022-06-25T19:02:53Z" and the server response was generated at "2022-06-25T19:02:54Z". The CI/CD pipeline took around 1 second to run.

```
catarinapereira@cloud:~$ wget --server-response --output-document response.out --header='Content-Type: application/json' --post-data '{"text": "#covid19 new york"}' http://10.244.0.14:5006/api/american
--2022-06-25 19:02:53-- http://10.244.0.14:5006/api/american
Connecting to 10.244.0.14:5006... connected.
HTTP request sent, awaiting response...
HTTP/1.1 200 OK
Server: Werkzeug/2.1.2 Python/3.9.13
Date: Sat, 25 Jun 2022 19:02:54 GMT
Content-Type: application/json
Content-Length: 71
Connection: close
Length: 71 [application/json]
Saving to: 'response.out'

response.out      100%[=====]          71  --.-KB/s   in 0s

2022-06-25 19:02:54 (4.45 MB/s) - 'response.out' saved [71/71]
```

HTTP Request sent on client

```
catarinapereira@cloud:~$ argocd app logs catarinapereira-american-predictor
* Serving Flask app 'rest_api_server' (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: off
* Running on all addresses (0.0.0.0)
  WARNING: This is a development server. Do not use it in a production deployment.
* Running on http://127.0.0.1:5006
* Running on http://10.244.0.13:5006 (Press CTRL+C to quit)
* Serving Flask app 'rest_api_server' (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: off
* Running on all addresses (0.0.0.0)
  WARNING: This is a development server. Do not use it in a production deployment.
* Running on http://127.0.0.1:5006
* Running on http://10.244.0.14:5006 (Press CTRL+C to quit)
10.244.0.1 - - [25/Jun/2022 19:02:54] "POST /api/american HTTP/1.1" 200 -
10.244.0.1 - - [25/Jun/2022 19:03:04] "POST /api/american HTTP/1.1" 200 -
10.244.0.1 - - [25/Jun/2022 19:04:04] "POST /api/american HTTP/1.1" 200 -
```

Server's responses

3. How long application stays offline (inaccessible) during the update

By updating the container "catarinaedp/american-predictor" from the tag "v2.0.9" to the tag "v2.0.10", ArgoCD started redeploying at "2022-06-24T19:47:18Z" and ended at "2022-06-24T19:47:23Z". During these 5 seconds the application remained inaccessible.

```
157 operationState:
158   finishedAt: "2022-06-24T19:47:23Z"
159   message: successfully synced (all tasks run)
160
161   initiatedBy:
162     automated: true
163   retry:
164     limit: 5
165   sync:
166     revision: b5f8fa45570806d0c28018358736a77233a1ad53
167   phase: Succeeded
168   startedAt: "2022-06-24T19:47:18Z"
169
170 resources:
171   - group: ""
172     hookPhase: Running
173     kind: Service
174     message: service/american-predictor-service unchanged
175     name: american-predictor-service
176     namespace: catarinapereira
177     status: Synced
178     syncPhase: Sync
179     version: v1
180   - group: apps
181     hookPhase: Running
182     kind: Deployment
183     message: deployment.apps/american-predictor-deployment configured
184     name: american-predictor-deployment
185     namespace: catarinapereira
186     status: Synced
187     syncPhase: Sync
188     version: v1
189     revision: b5f8fa45570806d0c28018358736a77233a1ad53
190     source:
191       path: kubernetes
192       repoURL: https://github.com/aikaterhine/american-predictor
193     reconciledAt: "2022-06-25T15:05:18Z"
194 resources:
195   - health:
196     status: Healthy
197     kind: Service
198     name: american-predictor-service
199     namespace: catarinapereira
200     status: Synced
```

image catarinaedp/american-predictor:v2.0.10

```
201   version: v1
202   - group: apps
203     health:
204       status: Healthy
205     kind: Deployment
206     name: american-predictor-deployment
207     namespace: catarinapereira
208     status: Synced
209     version: v1
210     sourceType: Directory
211     summary:
212       images:
213         - catarinaedp/american-predictor:v2.0.10
214     sync:
215       comparedTo:
216         destination:
217           namespace: catarinapereira
218           server: https://kubernetes.default.svc
219         source:
220           path: kubernetes
221           repoURL: https://github.com/aikaterhine/american-predictor
222           revision: b5f8fa45570806d0c28018358736a77233a1ad53
223         status: Synced
224
```