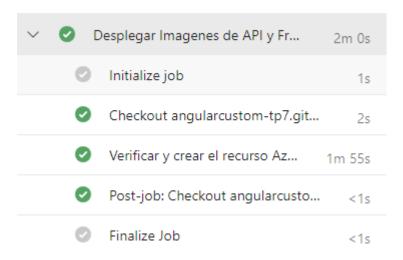
- 4.1 Modificar nuestro pipeline para incluir el deploy en QA y PROD de Imagenes Docker en Servicio Azure App Services con Soporte para Contenedores
- 4.1.1 Agregar a nuestro pipeline una nueva etapa que dependa de nuestra etapa de Construcción y Pruebas y de la etapa de Construcción de Imagenes Docker y subida a ACR realizada en el TP08



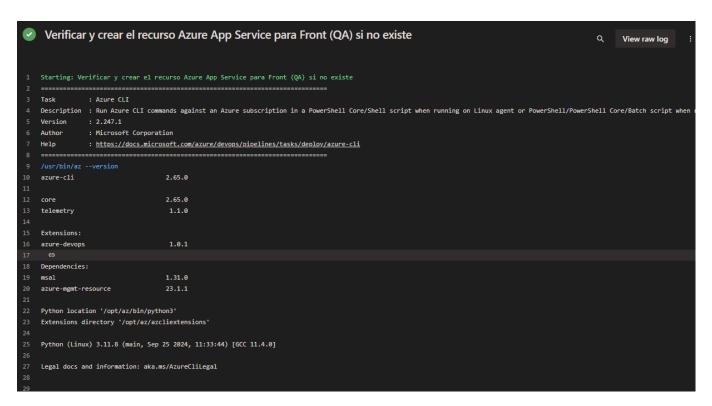
## Desplegar Imagenes en Azure App Service (QA)



# 4.2.1 Agregar tareas para generar Front en Azure App Service con Soporte para Contenedores

```
# DEPLOY DOCKER FRONT IMAGE TO AZURE APP SERVICE (QA)
Settings
- task: AzureCLI@2
 · displayName: 'Verificar y crear el recurso Azure App Service para Front (QA) si no existe'
        -azureSubscription: '$(ConnectedServiceName)'
        -scriptType: 'bash'
         -scriptLocation: 'inlineScript'
         ·inlineScript:
               ·#-Verificar·si·el·App·Service·para·el·Front·ya·existe
             if:!az:webapp:list:--query:"[?name=='$(WebAppFrontNameContainersQA)'&&:resourceGroup=='$(ResourceGroupName)']-|:length(@)"--o-tsv-|-grep
                  echo "El App Service para Front QA no existe. Creando...
                   # Crear el App Service sin especificar la imagen del contenedor
                   --az-webapp-create---resource-group-$(ResourceGroupName)---plan-$(AppServicePlanLinux)---name-$(WebAppFrontNameContainersQA)---deployment-c
               else
                  --echo-"El-App-Service-para-Front-QA-ya-existe.-Actualizando-la-imagen..."
                #-Configurar el-App-Service para usar Azure Container Registry (ACR)
                az webapp config container set ---name $(WebAppFrontNameContainersQA) ---resource-group $(ResourceGroupName) -\
                   ---container-image-name $(acrLoginServer)/$(frontImageName):$(frontImageTag) \
                    ---container-registry-url https://$(acrLoginServer) \
                    ---container-registry-user $(acrName) \
                 ---container-registry-password $(az-acr-credential-show---name-$(acrName)---query-"passwords[0].value"--o-tsv)
               # Establecer variables de entorno para el front-end
                az \cdot we bapp \cdot config \cdot appsettings \cdot set \cdot -- name \cdot \$ (WebAppFrontNameContainersQA) \cdot -- resource - group \cdot \$ (ResourceGroupName) \cdot \setminus (ResourceGro
                 ---settings-API_URL="http://$(WebAppApiNameContainersQA).azurewebsites.net"
```

```
41
     · · · · · # · Opcional: · Reiniciar · las · aplicaciones · web · para · aplicar · cambios
          Settings
        ---task: AzureCLI@2
43
44
     · · · · · · · displayName: · 'Reiniciar · App · Service · de · API · (QA)'
45 V
     ····inputs:
46
        -----azureSubscription: '$(ConnectedServiceName)'
           ---scriptType: 'bash'
47
        · · · · · scriptLocation: 'inlineScript'
    ····inlineScript:
49 V
50
     51
          Settings
52 VIII -- task: AzureCLI@2
     · · · · · · displayName: 'Reiniciar · App · Service · de · Front · (QA)'
53
     ····inputs:
           azureSubscription: '$(ConnectedServiceName)'
55
        ···scriptType: 'bash'
56
     ····scriptLocation: 'inlineScript'
57
     ····inlineScript:
58 \
    60
```



 4.2.2 Agregar variables necesarias para el funcionamiento de la nueva etapa considerando que debe haber 2 entornos QA y PROD para Back y Front.

```
# Variables para QA
backContainerInstanceNameQA: 'as-crud-api-qa-sm'
frontContainerInstanceNameQA: 'as-crud-front-ga-sm'
backImageTagQA: 'qa'
-frontImageTagQA: 'qa'
·container-cpu-api-qa: ·1·#·CPUs·de·nuestro·container·de·QA
container-memory-api-ga: 1.5 # RAM de nuestro container de OA
WebAppApiNameContainersQA: 'my-webapp-api-qa'
WebAppFrontNameContainersQA: 'my-webapp-front-qa'
container-url-api-qa: 'as-crud-api-qa-sm.westeurope.azurecontainer.io'
# Variables para PROD
backContainerInstanceNamePROD: 'as-crud-api-prod-sm'
frontContainerInstanceNamePROD: 'as-crud-front-prod-sm'
backImageTagPROD: 'prod'
frontImageTagPROD: 'prod'
container-cpu-api-prod: 1 # Ajusta según sea necesario
container-memory-api-prod: 1.5 # Ajusta según sea necesario
WebAppApiNameContainersPROD: 'my-webapp-api-prod'
WebAppFrontNameContainersPROD: 'my-webapp-front-prod'
container-url-api-prod: 'as-crud-api-prod-sm.westeurope.azurecontainer.io'
# Variables comunes
AppServicePlanLinux: 'MiWebApp02'
cnn_string_qaa: '$(cnn_string_qa)' # Usamos la misma cadena para QA y PROD
```

 4.2.3 Agregar tareas para correr pruebas de integración en el entorno de QA de Back y Front creado en Azure App Services con Soporte para Contenedores.

```
194 #-----
195 # Ejecutar · pruebas · E2E · del · Front-End · en · Azure · App · Service · (QA)
     ----script:
     echo "Ejecutando pruebas E2E del Front-End en Azure App Service (QA)..."
199
     500
    501
    · · · · · · · # · Publicar · resultados · de · pruebas · E2E · del · Front-End
502
     PublishTestResults@2
503
     ········displayName: ·'Publicar-Resultados de Pruebas E2E de Front-End en Azure App Service (QA)'
504
     · · · · · · · · inputs:
505
       · · · · testResultsFormat: 'JUnit'
506
507
      testResultsFiles: 'cypress/results/*.xml'
        ····failTaskOnFailedTests: true
803
```

 4.2.4 Agregar etapa que dependa de la etapa de Deploy en QA que genere un entorno de PROD.

```
### STAGE DEPLOY TO AZURE APP SERVICE PROD
   - stage: DeployImagesToAppServicePROD
     displayName: 'Desplegar Imágenes en Azure App Service (PROD)'
     dependsOn:
     ··- DeployImagesToAppServiceQA
     · · - · IntegrationTestsQA
     condition: succeeded()
     jobs:
     ··--job: DeployImagesToAppServicePROD
       displayName: 'Desplegar Imágenes de API y Front en Azure App Service (PROD)'
         vmImage: 'ubuntu-latest'
         ·steps:
       # Fetch ACR credentials
            Settings
         ···-·task: AzureCLI@2
          · · · · displayName: · 'Fetch · ACR · credentials'
            · · · inputs:
              --- azureSubscription: '$(ConnectedServiceName)'
              --- scriptType: bash
              scriptLocation: inlineScript
           ···inlineScript:
           · · · · · · · · · · · ACR_PASSWORD=$(az · acr · credential · show · --name · $(acrName) · --query · "passwords[0] . value" · -o · tsv)
           echo "##vso[task.setvariable variable=ACR_PASSWORD]$ACR_PASSWORD
450
451
             # · DEPLOY · DOCKER · API · IMAGE · TO · AZURE · APP · SERVICE · (PROD)
452
             #-----
             Settings
453
            ·-·task: AzureCLI@2
              ·displayName: 'Verificar · y · crear · el · recurso · Azure · App · Service · para · API · (PROD) · si · no · existe '
455
456
              - azureSubscription: '$(ConnectedServiceName)'
457
                scriptType: 'bash'
                scriptLocation: 'inlineScript'
458
459
               · inlineScript: |
                 # Verificar si el App Service para la API ya existe
461
                 · if·!-az-webapp list---query-"[?name=='$(WebAppApiNameContainersPROD)'-&&-resourceGroup=='$(ResourceGroupName)']-|-length(@)"--o-tsv-|-grep
462
                  echo "El App Service para API PROD no existe. Creando...
463
                  · # Crear el App Service sin especificar la imagen del contenedor
464
                    az webapp create --resource-group $(ResourceGroupName) --plan $(AppServicePlanLinux) --name $(WebAppApiNameContainersPROD) --deployment-c
465
                 else
                  echo "El App Service para API PROD ya existe. Actualizando la imagen..."
467
468
469
                 · # · Configurar · el · App · Service · para · usar · Azure · Container · Registry · (ACR)
470
                  -az webapp config container set --name $(WebAppApiNameContainersPROD) --resource-group $(ResourceGroupName) \
471
                   ---container-image-name $(acrLoginServer)/$(backImageName):$(backImageTagPROD)
                   ---container-registry-url https://$(acrLoginServer) \
473
                   ---container-registry-user-$(acrName)
474
                  ··--container-registry-password $(ACR_PASSWORD)
475
476
                 · #·Establecer·variables·de·entorno·para·el·back-end
                  az webapp config appsettings set --name $(WebAppApiNameContainersPROD) --resource-group $(ResourceGroupName) \
```

---settings ConnectionStrings\_DefaultConnection="\$(cnn\_string\_qaa)" # Usamos la misma cadena

```
# DEPLOY DOCKER FRONT IMAGE TO AZURE APP SERVICE (PROD)
483
              -- task: AzureCLI@2
              - displayName: 'Verificaryy crearel recurso Azure App Service para Front (PROD) si no existe
485
                azureSubscription: '$(ConnectedServiceName)'
486
487
                --scriptType: 'bash'
                 --scriptLocation: 'inlineScript'
                · · inlineScript: |
490
                  -- # - Verificar - si - el - App - Service - para - el - Front - ya - existe
                  - if ! az webapp list --query "['name=='$(WebAppFrontNameContainersPROD)' && resourceGroup=='$(ResourceGroupName)'] | length(@)" -o tsv | grep -- echo "El-App Service para Front-PROD no existe. Creando..."
- # Crear el App Service sin especificar la imagen del contenedor
491
492
                     -az-webapp-create---resource-group $(ResourceGroupName)---plan-$(AppServicePlanLinux)---name-$(WebAppFrontNameContainersPROD)---deployment-c
495
                  · else
496
                    echo "El App Service para Front PROD ya existe. Actualizando la imagen..."
497
                   \cdot \# \circ \mathsf{Configurar} \circ \mathsf{el} \circ \mathsf{App} \circ \mathsf{Service} \cdot \mathsf{para} \circ \mathsf{usar} \circ \mathsf{Azure} \circ \mathsf{Container} \circ \mathsf{Registry} \circ (\mathsf{ACR})
500
                   · az·webapp·config·container·set·--name·$(WebAppFrontNameContainersPROD)·--resource-group·$(ResourceGroupName)·\
                     ---container-image-name $(acrLoginServer)/$(frontImageName):$(frontImageTagPROD) \
501
                    ---container-registry-url https://$(acrLoginServer)
                    ---container-registry-user $(acrName)
                    ----container-registry-password $(ACR_PASSWORD)
505
                   · # Establecer variables de entorno para el front-end
                   --az-webapp-config-appsettings-set---name-$(WebAppFrontNameContainersPROD)---resource-group-$(ResourceGroupName)-\
                ·····settings API_URL="http://$(WebAppApiNameContainersPROD).azurewebsites.net"
Settings
        ···-task: AzureCLI@2
           displayName: 'Reiniciar App Service de API (PROD)'
              - azureSubscription: '$(ConnectedServiceName)'
              ---scriptType: 'bash'
              scriptLocation: 'inlineScript'
           ···inlineScript:
          ·····az·webapp·restart·--name·$(WebAppApiNameContainers)·--resource-group·$(ResourceGroupName)
           Settings
        ----task: AzureCLI@2
        displayName: 'Reiniciar App Service de Front (PROD)'
        · · · inputs:
              azureSubscription: '$(ConnectedServiceName)'

··scriptType: 'bash'
              scriptLocation: 'inlineScript'
              · inlineScript: |
          · · · · · · az · webapp · restart · --name · $(WebAppFrontNameContainers) · --resource-group · $(ResourceGroupName)
```

4.2.5 Entregar un pipeline que incluya:

A) Etapa Construcción y Pruebas Unitarias y Code Coverage Back y Front

```
stages:
      --stage: Build
--displayName: 'Build-Stage'
47
48
       ·jobs:
       -jobs:

# Job para el Back-End

-- job: Backend

-- displayName: 'Build y Análisis del Back-End'

-- steps:

-- checkout: self

-- detchDepth: 0
51
55
     ....#-Restaurar-paquetes-NuGet
     60
61
      .....# Compilar la solución del back-end y pruebas
64
     OnthetCoreCLI@2
       displayName: 'Build Backend y Pruebas Unitarias'
.....inputs:
.....command: 'build'
.....projects: '**/*.sln' -# Esto compila tanto EmployeeCrudApi como EmployeeCrudApi.Tests
.....arguments: '--configuration $(configuration)'
66
67
69
70
      -----#-Publicar-Back-End
       - - task: DotNetCoreCLI@2
                ··displayName: 'Publicar Back-End'
75
76
77
```

```
81 | - | - | - | - # - Publicar - Artefactos - del - Back-End
           ---task: PublishBuildArtifacts@1
          · displayName: 'Publicar Artefactos de Back'
          ···inputs:
          pathtoPublish: '$(buildOutput)'
 85
            · · · · artifactName: 'drop-back'
 86
            publishLocation: 'Container'
 87
 88
            Settings
 89
       ----task: PublishPipelineArtifact@1
          displayName: 'Publicar Dockerfile de Back'
 91
       · · · · · · inputs:
       ·················targetPath: '$(Build.SourcesDirectory)/api/Dockerfile'
 92
 93
       artifact: 'dockerfile-back'
 94
 95
       --#-Job-para-el-Front-End
 96
       ··--job: Frontend
 97
       displayName: 'Build y Análisis del Front-End'
       · · · steps:
99
       · · · · · · · · checkout: self
       fetchDepth: 0
100
101
      ····#·Instalar·Node.js
102
            Settings
       -----task: NodeTool@0
103
104
           · inputs:
           versionSpec: '18.x'
          displayName: 'Instalar Node.js'
106
197
108
          --- # · Instalar · dependencias · del · front-end
109
            ---script: npm install
110
            · displayName: 'Instalar Dependencias de Front'
           workingDirectory: 'EmployeeCrudAngular'
111
112
         Generar el archivo env.js
   113
              ---script: node src/generate-env.js
   114
               displayName: 'Generar archivo env.js'
   115
               workingDirectory: './EmployeeCrudAngular'
   116
   117
   118
              · · # · Compilar · el · front-end
   119
              - displayName: 'Build de Front'
   120
   121
               workingDirectory: './EmployeeCrudAngular'
   122
              ···condition: succeeded()
   123
   124
         Publicar artefactos del front-end
                 Settings
         PublishBuildArtifacts@1
   125
   126
               - displayName: 'Publicar Artefactos de Front'
   127
              · · · inputs:
              pathtoPublish: './EmployeeCrudAngular/dist'
   128
              ----artifactName: 'drop-front'
   129
   130
               publishLocation: 'Container'
   131
                 Settings
         -----task: PublishPipelineArtifact@1
   132
               displayName: 'Publicar Dockerfile de Front'
   133
   134
              · · · · inputs:
               · · · · targetPath: '$(Build.SourcesDirectory)/front/Dockerfile'
   135
          artifact: 'dockerfile-front'
   136
   137
```

#### B) Construcción de Imágenes Docker y subida a ACR

```
### · STAGE · BUILD · DOCKER · IMAGES · Y · PUSH · A · AZURE · CONTAINER · REGISTRY
 stage: DockerBuildAndPush

    displayName: 'Construir y Subir Imágenes Docker a ACR'

  -jobs:
   --- job: docker build and push
  displayName: 'Construir y Subir Imágenes Docker a ACR'
       pool:
       vmImage: 'ubuntu-latest'
  ····steps:
  · · · · · · · checkout: self
153
           #-BUILD-DOCKER-BACK-IMAGE-Y-PUSH-A-AZURE-CONTAINER-REGISTRY
155
           #-----
           Settings
     DownloadPipelineArtifact@2
          displayName: 'Descargar Artefactos de Back'
158
          · · inputs:
          buildType: 'current'
160
161
            artifactName: 'drop-back'
          targetPath: '$(Pipeline.Workspace)/drop-back'
162
           Settings
164
          -- task: DownloadPipelineArtifact@2
165
          displayName: 'Descargar Dockerfile de Back'
166
          · · · inputs:
167
           buildType: 'current'
            artifactName: 'dockerfile-back'
168
169
           targetPath: '$(Pipeline.Workspace)/dockerfile-back'
170
           Settings
171
          ---task: AzureCLI@2
172
           displayName: 'Iniciar Sesión en Azure Container Registry (ACR)'
          ···inputs:
173
174
           ----azureSubscription: '$(ConnectedServiceName)'
175
          ···scriptType: bash
             scriptLocation: inlineScript
            · inlineScript:
177
          az acr login -- name $(acrName)
179
           Settings
         - - task: Docker@2
188
          displayName: 'Construir Imagen Docker para Back'
          ····inputs:
182
             -command: build
             repository: $(acrLoginServer)/$(backImageName)
184
            dockerfile: $(Pipeline.Workspace)/dockerfile-back/Dockerfile
186
             buildContext: $(Pipeline.Workspace)/drop-back
      tags: '$(backImageTagQA),$(backImageTagPROD)'
                   Settings
  189
           ······--task: Docker@2
           ··················displayName:·'Subir·Imagen·Docker·de·Back·a·ACR'
  190
           ····inputs:
  191
           · · · · · · · · command: · push
  192
           repository: $(acrLoginServer)/$(backImageName)
  193
  194
           ············tags:·'$(backImageTagQA),$(backImageTagPROD)'
  195
```

```
196
     197
          # · BUILD · DOCKER · FRONT · IMAGE · Y · PUSH · A · AZURE · CONTAINER · REGISTRY
198
199
    -----task: DownloadPipelineArtifact@2
200
     displayName: 'Descargar Artefactos de Front'
201
202
     ····inputs:
     artifactName: 'drop-front'
204
     · | · | · | · | · targetPath: '$(Pipeline.Workspace)/drop-front'
205
206
          Settings
     -----task: DownloadPipelineArtifact@2
207
208
     displayName: 'Descargar Dockerfile de Front'
     ----inputs:
209
     buildType: 'current'
210
     ·····artifactName: 'dockerfile-front'
211
212
     213
          Settings
    |-----task: Docker@2
214
     ·····displayName: ·'Construir Imagen Docker para Front'
215
     · · · · · · inputs:
216
217
     · · · · · · · · · · command: · build
218
     ·····repository: $(acrLoginServer)/$(frontImageName)
     dockerfile: $(Pipeline.Workspace)/dockerfile-front/Dockerfile
219
220
     buildContext: $(Pipeline.Workspace)/drop-front
     221
222
          Settings
    223
224
     · · · · · · · displayName: 'Subir Imagen Docker de Front a ACR'
     ····inputs:
225
226
     · · · · · · · · · · command: · push
227
     ······repository: $(acrLoginServer)/$(frontImageName)
228
     229
```

• C) Deploy Back y Front en QA con pruebas de integración para Azure Web Apps

```
231
232
      ### STAGE: Deploy to Azure Web Apps (QA)
233
      #-----
234
      - stage: DeployToAzureWebAppsQA
      displayName: 'Deploy to Azure Web Apps (QA)'
235
236
      dependsOn: DockerBuildAndPush
      --condition: succeeded()
237
238
      · jobs:
239
      ···#·Job·para·el·Back-End
      ···--job: DeployQABackend
240
      · · · · displayName: 'Deploy to QA - · Back-End'
241
242
      · · · · · steps:
            Settings
243
       ·····task: DownloadPipelineArtifact@2
244
      ····displayName: 'Download Build Artifacts'
      ····inputs:
245
       ·····buildType: 'current'
246
       ···········artifactName: 'drop-back'
247
       targetPath: '$(Pipeline.Workspace)/drop-back'
248
249
            Settings
250
      ----task: AzureWebApp@1
       ·····displayName: 'Deploy to QA - Back-End'
251
      ····inputs:
252
253
      ··············azureSubscription: '$(ConnectedServiceName)'
       ······appTvpe: 'webApp'
254
255
      · · · · · · · appName: 'EmployeeCrudBack-QA'
256
       -----package: '$(Pipeline.Workspace)/drop-back'
257
258
     ---#-Job-para-el-Front-End
259
      ----job: DeployQAFrontend
     · · · · displayName: 'Deploy to QA - Front-End'
260
     ····steps:
261
          Settings
     -----task: DownloadPipelineArtifact@2
262
263
      displayName: 'Download Build Artifacts'
      ····inputs:
264
      ····buildType: 'current'
      ·····artifactName: 'drop-front'
266
267
     ····targetPath: '$(Pipeline.Workspace)/drop-front'
268
          Settings
     ----task: AzureWebApp@1
269
270
      · · · · · displayName: 'Deploy to QA - Front-End'
      ····inputs:
271
      ······azureSubscription: '$(ConnectedServiceName)'
272
      ······appType: 'webApp'
273
      ····appName: 'EmployeeCrudFront-QA'
274
     ·····package: '$(Pipeline.Workspace)/drop-front/employee-crud-angular/browser'
275
```

```
278
     ···--job: IntegrationTestsAzureWebAppsQA
279
     displayName: 'Tests de Integracion en Azure Web Apps (QA)'
     · · · · · depends0n:
280
281
     ····DeployQABackend
     ···· DeployQAFrontend
282
283
     ····steps:
     ····script: npm install
284
285
     ····workingDirectory: ·./EmployeeCrudAngular
     ····displayName: 'Instalar Dependencias para Pruebas'
286
287
288
      ······script:·npx·cypress·run·--config·baseUrl=https://EmployeeCRUDFront.azurewebsites.net
289
     ·····workingDirectory: ../EmployeeCrudAngular
     · · · · · displayName: 'Correr Tests en Cypress E2E'
290
291
          Settings
     PublishTestResults@2
292
      ·····displayName: 'Publicar Resultados de Cypress'
      ····inputs:
294
295
      ·····testResultsFormat: 'JUnit'
     ·····testResultsFiles: 'EmployeeCrudAngular/cypress/results/*.xml'
296
297
     ·····testRunTitle: 'Cypress E2E Tests - QA'
     failTaskOnFailedTests: true
298
```

D) Deploy Back y Front en QA con pruebas de integración para ACI

```
303
304
     ### STAGE DEPLOY TO ACI QA
305
306
307
      --stage: DeployToACIQA
      displayName: 'Desplegar en Azure Container Instances (ACI) QA'
308
309
        dependsOn: DockerBuildAndPush
310
        ·jobs:
311
        ···-job: deploy_to_aci_qa
          · displayName: 'Desplegar en Azure Container Instances (ACI) QA'
312
313
            ··vmImage: 'ubuntu-latest'
314
315
           · · steps: · · ·
316
        ··· #·Fetch·ACR·credentials
317
              Settings
318
            ----task: AzureCLI@2
              displayName: 'Fetch ACR credentials'
319
320
              · · · inputs:
321
            azureSubscription: '$(ConnectedServiceName)'
322
            scriptType: bash
323
                 -- scriptLocation: inlineScript
324
                ···inlineScript: |
325
            echo "##vso[task.setvariable variable=ACR_PASSWORD]$ACR_PASSWORD
326
327
     328
329
             -- task: AzureCLI@2
330
             displayName: 'Desplegar Imagen Docker de Back en ACI QA'
331
              ·inputs:
                -azureSubscription: '$(ConnectedServiceName)'
332
333
                -scriptType: bash
334
                scriptLocation: inlineScript
335
               · inlineScript: |
336
                 echo "Resource Group: $ (ResourceGroupName)"
337
                 echo "Container Instance Name: $(backContainerInstanceNameQA)"
                  echo-"ACR-Login-Server: $(acrLoginServer)"
338
                  echo | "Image | Name: | $(backImageName)"
339
340
                  echo "Image Tag: $(backImageTagQA)"
341
                  echo "Connection String: $(cnn_string_qaa)"
342
343
                  ·#·Delete·the·existing·container·if·present
344
                  -az · container · delete · --resource-group · $(ResourceGroupName) · --name · $(backContainerInstanceNameQA) · --yes · | | · true
345
                  #-Create the container
                  az container create -- resource-group $(ResourceGroupName) \
348
                   ··--location westeurope \
349
                    ---name $(backContainerInstanceNameQA) \
                   --image $(acrLoginServer)/$(backImageName):$(backImageTagQA) \
350
351
                    --registry-login-server $(acrLoginServer) \
                   --registry-username $(acrName) \
352
                    ---registry-password-$(ACR_PASSWORD)·\
353
354
                    \cdot - - dns - name - label \cdot \$ (backContainerInstanceNameQA) \cdot \backslash
355
                    ---ports -80 - \
356
                    ---environment-variables ConnectionStrings__DefaultConnection="$(cnn_string_qaa)" \
357
                    ---restart-policy-Always-\
358
                    ---cpu-$(container-cpu-api-qa)-\
                    --memory $(container-memory-api-qa)
```

```
362
                                         - task: AzureCLI@2
                                             displayName: 'Desplegar Imagen Docker de Front en ACI QA'
    363
                                            ·inputs:
    365
                                               -- azureSubscription: '$(ConnectedServiceName)'
    366
                                                ·scriptTvpe: bash
                                                -scriptLocation: inlineScript
    367
    368
                                                ·inlineScript:
    369
                                                  echo · "Resource · Group: · $(ResourceGroupName)"
     370
                                                      echo "Container Instance Name: $(frontContainerInstanceNameQA)"
    371
                                                      echo "ACR Login Server: $(acrLoginServer)"
    372
                                                      echo "Image Name: $(frontImageName)
                                                      echo "Image Tag: $(frontImageTagQA)"
    373
    374
    375
                                                      ·#-Delete·the·existing·front·container·if·present
    376
                                                      \cdot \texttt{az} \cdot \texttt{container} \cdot \texttt{delete} \cdot -- \texttt{resource-group} \cdot \$(\texttt{ResourceGroupName}) \cdot -- \texttt{name} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanceNameQA}) \cdot -- \texttt{yes} \cdot || \cdot \texttt{true} \cdot \$(\texttt{frontContainerInstanc
    377
    378
                                                       \# \cdot \mathsf{Create} \cdot \mathsf{the} \cdot \mathsf{front} \cdot \mathsf{end} \cdot \mathsf{container}
    379
                                                       az container create -- resource-group $ (ResourceGroupName) \
    380
                                                           ·--location westeurope \
    381
                                                           --name $(frontContainerInstanceNameOA) \
                                                           --image $(acrLoginServer)/$(frontImageName):$(frontImageTagQA) \
    382
    383
                                                           ---registry-login-server $(acrLoginServer) \
    384
                                                           ---registry-username $(acrName)
    385
                                                            --registry-password $(ACR_PASSWORD) \
    386
                                                            --dns-name-label $(frontContainerInstanceNameQA) \
    387
                                                           ---ports 80 · \
    388
                                                           --environment-variables API_URL=$(container-url-api-qa) \
    389
                                                           ·--restart-policy Always \
    398
                                                           ---cpu·1·\
    391
                                                       ··--memory 1.5
    392
393
                                         # Ejecutar pruebas E2E del Front-Enden el contenedor de ACI QA
394
                                       --script:
395
                                              echo "Ejecutando pruebas E2E del Front-End en ACI QA..."
                                              npx cypress run --config baseUrl=http://$(frontContainerInstanceNameQA).westeurope.azurecontainer.io
397
                                         displayName: 'Ejecutar Pruebas E2E de Front-End en ACI QA con Cypress'
398
399
                            ----#-Publicar-resultados de pruebas E2E del Front-End
                                         Settings
                                 ----task: PublishTestResults@2
400
401
                                           · displayName: 'Publicar Resultados de Pruebas E2E de Front-End en ACI QA'
402
                                          ··inputs:
                                             testResultsFormat: 'JUnit'
403
                                              testResultsFiles: 'cypress/results/*.xml'
                                         failTaskOnFailedTests: true
```

 E) Deploy Back y Front en QA con pruebas de integración para Azure Web Apps con Soporte para contenedores

```
408
      ### STAGE DEPLOY TO AZURE APP SERVICE OA
499
411

    stage: DeployImagesToAppServiceQA

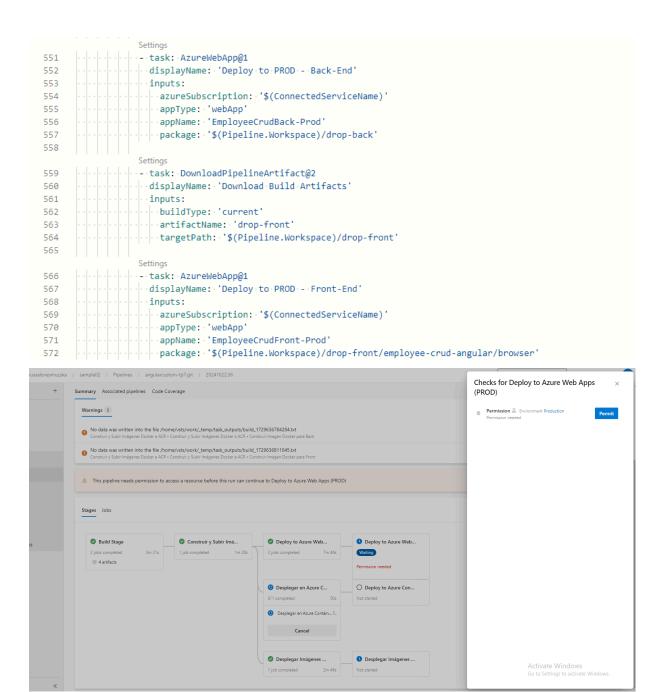
      displayName: 'Desplegar Imágenes en Azure App Service (QA)'
413
       · · dependsOn:
        ···- DockerBuildAndPush
414
415
       -condition: succeeded()
416
417
        ---job: DeployImagesToAppServiceQA
418
          displayName: 'Desplegar Imágenes de API y Front en Azure App Service (QA)'
419
           -pool:
420
            ··vmImage: 'ubuntu-latest'
            ·steps:
        · · · · · # · Fetch · ACR · credentials
422
              Settings
             --task: AzureCLI@2
              displayName: 'Fetch ACR credentials'
424
425
              · · · inputs:
426
                 azureSubscription: '$(ConnectedServiceName)'
427
                 scriptType: bash
428
                scriptLocation: inlineScript
429
                ··inlineScript:·
                  --ACR_PASSWORD=$(az-acr-credential-show---name-$(acrName)---query-"passwords[0].value"--o-tsv)
430
                  echo "##vso[task.setvariable variable=ACR_PASSWORD]$ACR_PASSWORD"
```

```
433
                        # DEPLOY DOCKER API IMAGE TO AZURE APP SERVICE (QA)
434
435
                         - task: AzureCLT@2
436
                           - displayName: 'Verificar-y-crear-el-recurso-Azure-App-Service-para-API-(QA)-si-no-existe
437
438
                              azureSubscription: '$(ConnectedServiceName)'
439
                               scriptLocation: 'inlineScript'
440
442
                                  ·#·Verificar·si·el·App·Service·para·la·API·ya·existe
                                 if: laz.webapp.list --query."[?name=='$(WebAppApiNameContainersQA)' && resourceGroup=='$(ResourceGroupName)'] | length(@)" -o tsv | grep -q
                                     -echo-"El-App Service para API QA no existe. Creando
444
445
                                   # Crear el App Service sin especificar la imagen del contenedor
                                     az webapp create --resource-group $(ResourceGroupName) --plan $(AppServicePlanLinux) --name $(WebAppApiNameContainersQA) --deployment-conta
447
                                 else
                                     echo "El App Service para API QA ya existe. Actualizando la imagen..."
449
450
                                 ·#-Configurar-el-App-Service-para-usar-Azure-Container-Registry-(ACR)
                                  az-webapp config container set --name $(WebAppApiNameContainersQA) --resource-group $(ResourceGroupName) -\
--container-image-name $(acrLoginServer)/$(backImageName):$(backImageTagQA) \
452
454
                                   \cdot \cdot \text{--container-registry-url} \cdot \underline{\text{https://\$(acrLoginServer)}} \cdot \backslash
                                   · · -- container-registry-user $(acrName)
456
                                  ---container-registry-password $(ACR_PASSWORD)
457
                                 ·#·Establecer·variables·de·entorno·para·el·back-end
459
                       ········az·webapp·config appsettings·set·-name·$(WebAppApiNameContainersQA)·--resource-group $(ResourceGroupName)·\
·········--settings·ConnectionStrings_DefaultConnection="$(cnn_string_qaa)"
460
462
                        # DEPLOY DOCKER FRONT IMAGE TO AZURE APP SERVICE (QA)
464
465
                         - task: AzureCLI@2
                            displayName: 'Verificar y crear el recurso Azure App Service para Front (QA) si no existe
466
467
468
                              -azureSubscription: '$(ConnectedServiceName)'
                               scriptType: 'bash
470
                               -scriptLocation: 'inlineScript'
                              ·inlineScript: |
                                 473
                                   # Crear el App Service sin especificar la imagen del contenedor
--az webapp create --resource-group $(ResourceGroupName) --plan $(AppServicePlanLinux) --name $(WebAppFrontNameContainersQA) --deployment-con
475
477
                                 else
                                     echo · "El · App · Service · para · Front · QA · ya · existe . · Actualizando · la · imagen . . . "
478
480
                                  ·#·Configurar·el·App·Service·para·usar·Azure·Container·Registry·(ACR)
                                  az webapp config container set --name $(WebAppFrontNameContainersQA) --resource-group $(ResourceGroupName) \
--container-image-name $(acrLoginServer)/$(frontImageName):$(frontImageTagQA) \
482
483
181
                                     ---container-registry-url https://$(acrLoginServer)
485
                                    ---container-registry-user $(acrName)
                                   ---container-registry-password $(ACR_PASSWORD)
487
                                 ·#·Establecer·variables·de·entorno·para·el·front-end
489
                                   az. we bapp: config: appsettings: set: --name: \$(WebAppFrontNameContainersQA): --resource-group \cdot \$(ResourceGroupName): \land (ResourceGroupName): \land (ResourceGrou
                           ·····settings API_URL="http://$(WebAppApiNameContainersQA).azurewebsites.net"
490
493
              # · Ejecutar · pruebas · E2E · del · Front-End · en · Azure · App · Service · (QA)
 495
 496
 497
                                   echo "Ejecutando pruebas E2E del Front-End en Azure App Service (QA)..."
 498
                                   --npx-cypress-run---config-baseUrl=https://$(WebAppFrontNameContainersQA).azurewebsites.net
                              displayName: 'Ejecutar Pruebas E2E de Front-End en Azure App Service (QA) con Cypress
 499
 500
 501
                           · # Publicar resultados de pruebas E2E del Front-End
                               Settings
                           ---task: PublishTestResults@2
 502
 503
                               - displayName: 'Publicar Resultados de Pruebas E2E de Front-End en Azure App Service (QA)'
 504
 505
                                    - testResultsFormat: 'JUnit'
                                       testResultsFiles: 'cypress/results/*.xml'
 506
 507
                              failTaskOnFailedTests: true
```

F) Aprobación manual de QA para los puntos C,D,E

• G) Deploy Back y Front en PROD para Azure Web Apps

```
###-STAGE: Deploy to Azure Web Apps (PROD)
532 ∨ - stage: DeployToAzureWebAppsProd
533 - displayName: 'Deploy to Azure Web Apps (PROD)'
     dependsOn: DeployToAzureWebAppsQA
     --condition: succeeded()
Settings
Settings
551 ∨ . . . . . . .
            ---task: AzureWebApp@1
             ---displayName: 'Deploy to PROD -- Back-End'
552
553 ∨
              554
555
         .....appType: 'webApp'
.....appName: 'EmployeeCrudBack-Prod'
....package: '$(Pipeline.Workspace)/drop-back'
556
557
```



### H) Deploy Back y Front en PROD para ACI

```
### STAGE: Deploy to ACI (PROD)
 578
 579
         - stage: DeployToACIProd
 580
           displayName: 'Deploy to Azure Container Instances (ACI) PROD'
 581
           -dependsOn: DeployToACIOA
 582
           -condition: succeeded()
 583
 584
             ·-·deployment: DeployToACIProd
 585
               displayName: 'Deploy to Azure Container Instances (ACI) PROD'
 586
                environment: 'Production'
 587
 588
                  ·runOnce:
 589
                    deploy:
 598
                       steps:
                       # Fetch ACR credentials
                          Settings
                         --task: AzureCLI@2
 592
 593
                            displayName: 'Fetch ACR credentials for PROD'
  594
                            inputs:
 595
                             azureSubscription: '$(ConnectedServiceName)'
 596
                              scriptType: bash
 597
                              scriptLocation: inlineScript
 598
                              inlineScript: |
 599
                                 ACR_PASSWORD=$(az acr credential show --name $(acrName) --query "passwords[0].value" -o tsv)
                               echo "##vso[task.setvariable variable=ACR_PASSWORD]$ACR_PASSWORD
 699
     602
603
                   - task: AzureCLT@2
                     displayName: 'Deploy Back-End Docker Image to ACI (PROD)'
604
605
                       azureSubscription: '$(ConnectedServiceName)'
                       scriptType: bash
608
                       scriptLocation: inlineScript
                       inlineScript: |
610
                         echo "Resource Group: $(ResourceGroupName)"
                         echo-"Container-Instance-Name: $(backContainerInstanceNamePROD)"
611
                         echo "ACR Login Server: $(acrLoginServer)
613
                         echo "Image Name: $(backImageName)"
echo "Image Tag: $(backImageTagPROD)'
614
615
                         echo · "Connection · String: · $(cnn_string_prod)" · · # · Usamos · cnn_string_qaa
616
                         # Delete the existing container if present
618
                         az container delete -- resource-group $(ResourceGroupName) -- name *$(backContainerInstanceNamePROD) -- yes | | true
620
                         #-Create-the-container
                         az container create -- resource-group $ (ResourceGroupName) \
621
                           ---location-westeurope-\
                           --name $(backContainerInstanceNamePROD) \
623
                           ---image $(acrLoginServer)/$(backImageName):$(backImageTagPROD) \
                          ---registry-login-server $(acrLoginServer) ---registry-username $(acrName) \
625
626
                           --registry-password $(ACR_PASSWORD) · \
628
                          ---dns-name-label $(backContainerInstanceNamePROD) \
630
                           --environment-variables ConnectionStrings_DefaultConnection="$(cnn_string_qaa)" \
                           --restart-policy Always \
--cpu $(container-cpu-api-prod) \
631
632
                           --memory $(container-memory-api-prod)
633
 635
                      · # · DEPLOY · DOCKER · FRONT · IMAGE · TO · ACI · PROD
                       - task: AzureCLI@2
 636
 637
                        displayName: 'Deploy Front-End Docker Image to ACI (PROD)'
 638
                        inputs:
                          azureSubscription: '$(ConnectedServiceName)'
 639
 640
                          scriptType: bash
 641
                          scriptLocation: inlineScript
 642
                          inlineScript: |
 643
                            echo "Resource Group: $(ResourceGroupName)"
                             echo "Container Instance Name: $(frontContainerInstanceNamePROD)"
 645
                             echo "ACR Login Server: $(acrLoginServer)
 646
                             echo "Image Name: $(frontImageName)"
 647
                             echo "Image Tag: $(frontImageTagPROD)
 648
 649
                             #-Delete the existing container if present
 650
                             -az-container delete --resource-group $(ResourceGroupName) ---name $(frontContainerInstanceNamePROD) ---yes | | -true
 651
 652
                             # Create the container
 653
                             az · container · create · -- resource-group · $ (ResourceGroupName) · \
 654
                              ---location-westeurone-\
                               ---name $(frontContainerInstanceNamePROD) \
 655
                              ---image $(acrLoginServer)/$(frontImageName):$(frontImageTagPROD) \
 656
 657
                               --registry-login-server $(acrLoginServer) \
 658
                               --registry-username $(acrName)
 659
                               --registry-password-$(ACR_PASSWORD)-\
 660
                               \cdot--dns-name-label\cdot$(frontContainerInstanceNamePROD)\cdot\
 661
                               --ports 80 \
 662
                               --environment-variables API_URL=$(container-url-api-prod) \
 663
                               --restart-policy Always \
 664
                               --cpu-1-\
 665
                               --memory 1.5
```

 I) Deploy Back y Front en PROD para Azure Web Apps con Soporte para contenedores

```
664
665
         ### - STAGE - DEPLOY - TO - AZURE - APP - SERVICE - PROD
666
667
668
         --stage: DeployImagesToAppServicePROD
669
         displayName: 'Desplegar Imágenes en Azure App Service (PROD)'
670
671
           --- DeployImagesToAppServiceQA
672
           condition: succeeded()
673
           jobs:
674
            ---job: DeployImagesToAppServicePROD
675
                ·displayName: 'Desplegar Imágenes de API y Front en Azure App Service (PROD)'
676
                -pool:
677
                  vmImage: 'ubuntu-latest'
678
                 steps:
           Fetch ACR credentials
                   Settings
                   -- task: AzureCLI@2
680
681
                   displayName: 'Fetch ACR credentials'
682
683
                       azureSubscription: '$(ConnectedServiceName)'
684
                        -scriptType: bash
685
                       scriptLocation: inlineScript
686
                       ··inlineScript: |
687
                          -ACR_PASSWORD=$(az-acr-credential-show---name-$(acrName)---query-"passwords[0].value"--o-tsv)
688
                   echo "##vso[task.setvariable variable=ACR_PASSWORD]$ACR_PASSWORD
689
690
691
               # - DEPLOY - DOCKER - API - IMAGE - TO - AZURE - APP - SERVICE - (PROD)
                - task: AzureCLI@2
693
                  displayName: 'Verificar y crear el recurso Azure App Service para API (PROD) si no existe'
695
                 inputs:
                  azureSubscription: '$(ConnectedServiceName)'
696
                   scriptType: 'bash'
                   scriptLocation: 'inlineScript'
                     ·#·Verificar·si·el·App·Service·para·la·API·ya·existe
                     if:!-az-webapp list---query-"[?name=="$(kebAppApINameContainersPROD)'-&&-resourceGroup=='$(ResourceGroupName)']-|-length(@)"--o-tsv-|-grep----echo-"El-App-Service-para-API-PROD-no-existe. Creando..."
703
                      ..# Crear el App Service sin especificar la imagen del contenedor
                       az webapp create --resource-group $(ResourceGroupName) ---plan $(AppServicePlanLinux) ---name $(WebAppApiNameContainersPROD) ---deployment-c
                       echo "El App Service para API PROD ya existe. Actualizando la imagen..."
706
                     fi
                     -#-Configurar-el-App-Service-para-usar-Azure-Container-Registry-(ACR)
709
                     -az-webapp-config-container-set---name-$(WebAppApiNameContainersPROD)---resource-group-$(ResourceGroupName)-\
                       ---container-image-name $(acrLoginServer)/$(backImageName):$(backImageTagPROD)
                       ---container-registry-url https://$(acrLoginServer)
712
                       ---container-registry-user $(acrName)
714
                      ---container-registry-password $(ACR PASSWORD)
                     · # Establecer variables de entorno para el back-end
                     -az-webapp config appsettings set --name $(WebAppApiNameContainersPROD) --resource-group $(ResourceGroupName) \
                     ---settings ConnectionStrings__DefaultConnection="$(cnn_string_qaa)" # Usamos la misma cadena
                # - DEPLOY - DOCKER - FRONT - TMAGE - TO - AZURE - APP - SERVICE - (PROD.)
                -- task: AzureCLI@2
                  displayName: 'Verificar y crear el recurso Azure App Service para Front (PROD) si no existe'
                  inputs:
                   azureSubscription: '$(ConnectedServiceName)'
727
728
                    scriptType: 'bash'
                    scriptLocation: 'inlineScript'
729
730
                    inlineScript: |
                     if | az webapp list --query "[?name=='$(WebAppFrontNameContainersPROD)' && resourceGroup=='$(ResourceGroupName)'] | length(@)" --o-tsv | grep --echo "El-App Service para Front PROD no existe. (reando..."

# Crear el App Service sin específica-la imagan dal contendon
732
733
                        **Crear el App Service sin especificar la imagen del contenedor
                       -az-webapp-create---resource-group-$(ResourceGroupName)---plan-$(AppServicePlanLinux)---name-$(WebAppFrontNameContainersPROD)---deployment
 735
                     else
736
737
                        echo "El App Service para Front PROD ya existe. Actualizando la imagen..."
                     # Configurar el App Service para usar Azure Container Registry (ACR)
-az webapp config container set --name $(WebAppFrontNameContainersPROD) --resource-group $(ResourceGroupName) \
741
742
                        ---container-image-name-$(acrLoginServer)/$(frontImageName):$(frontImageTagPROD)
                       ----container-registry-url·https://$(acrLoginServer) \
----container-registry-user-$(acrName) \
743
744
                       ----container-registry-password $(ACR_PASSWORD)
 746
                      \cdot \# \cdot \mathsf{Establecer} \cdot \mathsf{variables} \cdot \mathsf{de} \cdot \mathsf{entorno} \cdot \mathsf{para} \cdot \mathsf{el} \cdot \mathsf{front}\text{-}\mathsf{end}
 747
                      az webapp config appsettings set -- name $(WebAppFrontNameContainersPROD) -- resource-group $(ResourceGroupName) \
                    ----settings-API_URL="http://$(WebAppApiNameContainersPROD).azurewebsites.net
```

# **Pipeline Completo:**

