

# End Report

## CI/CD Pipeline

The gitlab-ci pipeline in my project was installed locally via the course-recommended docker setup. It consists of three stages, build, test and deploy.

In the build phase we tear down old deployments, build the testing environment, and start up all of the main application services.

In the test phase we run a linter, regular tests, and a shutdown test. The shutdown test is ran last, as it'll leave the application services in an unusable state. This stage will fail if any of the tests fail. Issues with the linter will not fail the build stage.

Finally in the deploy phase we re-deploy the application services.

## Run instructions

These are found in the README.md.

## Main learnings & difficulties

I had no prior major experience in setting up on-premise git implementations or CI/CD pipelines, and I think this was a great learning experience for me as a whole. Dockerizing everything in the application improved my expertise in that regard, and although I had thought about trying out test driven development, I hadn't, and I thought it worked well in this setting, with clear API definitions.

I didn't feel like I came across anything overwhelming with this work, and I thought it was well balanced for my skill level. Although, the 50h average time spent might be a stretch for the average student, at least if considering only the required implementation level. I spent about 13-15h in total for this coursework.

# Example runs

A failed run (test stage, other stages only contain basic output from docker):

GitLab

Projects ▾

Groups ▾

More ▾

comp-se-140-MessageQueue

Project overview

Repository

Issues 0

Merge Requests 0

CI / CD

Pipelines

Jobs

Schedules

Operations

Packages & Registries

Analytics

Wiki

Snippets

Members

Settings

Collapse sidebar

```
1 Running with gitlab-runner 13.6.0 (8fa89735)
2   on docker-stable nU14EpUx
3   > Preparing the "docker" executor
41  > Preparing environment
43  > Getting source from Git repository
48  > Executing "step_script" stage of the job script
49  $ docker version
50  Client: Docker Engine - Community
51  Version:           19.03.8
52  API version:       1.38 (downgraded from 1.40)
53  Go version:        go1.12.17
54  Git commit:        afacb8b7f0
55  Built:             Wed Mar 11 01:22:56 2020
56  OS/Arch:           linux/amd64
57  Experimental:      false
58  Server:
59  Engine:
60  Version:           18.06.3-ce
61  API version:       1.38 (minimum version 1.12)
62  Go version:        go1.10.3
63  Git commit:        d7080c1
64  Built:             Wed Feb 20 02:27:01 2019
65  OS/Arch:           linux/amd64
66  Experimental:      false
67  $ docker-compose version
68  docker-compose version 1.26.2, build eefe0d3
69  docker-py version: 4.2.2
70  CPython version: 3.7.7
71  OpenSSL version: OpenSSL 1.1.1g  21 Apr 2020
72  $ docker ps
73  CONTAINER ID        IMAGE                                     COMMAND                  CREATED              STATUS              PORTS
74  81ba964a17c7        c3e188a6b38f                          "sh /usr/local/bin/d..." 2 seconds ago       Up Less than a second
75  oncurrent-0-debf4c072b0f83db-build-2
76  9fa575c64ee2        comp-se-140-messagequeue_server        "/app/server/out"       7 minutes ago       Up 7 minutes       0.0.0.0:80->80/tcp
77  2869c1dad3b6        comp-se-140-messagequeue_httpserv      "/app/out"              7 minutes ago       Up 7 minutes       80/tcp
78  bf1533748a73        86e8ddd3c0dd                          "/usr/bin/dumb-init ..." 9 hours ago         Up 9 hours
79  oncurrent-0-08196deed1d700e58-docker-0-wait-for-service
80  11c598ca0e33        gitlab/gitlab-ce:latest                "/assets/wrapper"       15 hours ago        Up 15 hours (healthy) 0.0.0.0:80->80/tcp
81  536ec7f48360        gitlab/gitlab-runner:latest            "/usr/bin/dumb-init ..." 15 hours ago        Up 15 hours
82  $ docker-compose -f docker-compose-lint.yml up --abort-on-container-exit
83  Found orphan containers (tests, server, rabbitmq, httpserv, orig, imed, obse) for this project. If you removed or renamed this service in your config, you should remove it from Docker as well.
84  Starting lint ...
85  Attaching to lint
86  lint | api/messages.go:7:1: exported function GetMessages should have comment or be unexported
87  lint | api/messages.go:12:1: exported function GetMessagesBodyHandleError should have comment or be unexported
88  lint | api/runlog.go:5:1: exported function GetRunLog should have comment or be unexported
89  lint | api/runlog.go:10:1: exported function GetRunLogHandleError should have comment or be unexported
90  lint | api/state.go:11:2: don't use ALL_CAPS in Go names; use CamelCase
91  lint | api/state.go:11:2: exported const CMD_INIT should have comment (or a comment on this block) or be unexported
92  lint | api/state.go:12:2: don't use ALL_CAPS in Go names; use CamelCase
93  lint | api/state.go:13:2: don't use ALL_CAPS in Go names; use CamelCase
```

```

87 lint | api/runlog.go:10:1: exported function GetRunLogHandleError should have comment or be unexported
88 lint | api/state.go:11:2: don't use ALL_CAPS in Go names; use CamelCase
89 lint | api/state.go:11:2: exported const CMD_INIT should have comment (or a comment on this block) or be unexported
90 lint | api/state.go:12:2: don't use ALL_CAPS in Go names; use CamelCase
91 lint | api/state.go:13:2: don't use ALL_CAPS in Go names; use CamelCase
92 lint | api/state.go:14:2: don't use ALL_CAPS in Go names; use CamelCase
93 lint | api/state.go:17:1: exported function ValidState should have comment or be unexported
94 lint | api/state.go:27:1: exported function GetState should have comment or be unexported
95 lint | api/state.go:33:1: exported function PutState should have comment or be unexported
96 lint | api/state.go:56:1: exported function PutStateHandleError should have comment or be unexported
97 lint | api/state.go:63:1: exported function GetStateHandleError should have comment or be unexported
98 lint | api/utilities.go:9:1: exported function GetResponseBody should have comment or be unexported
99 lint | api/utilities.go:25:1: exported function GetResponse should have comment or be unexported
100 lint | httpserv/httpserv.go:12:1: exported function FileContents should have comment or be unexported
101 lint | orig/orig.go:50:1: exported function ShouldShutdown should have comment or be unexported
102 lint | orig/orig.go:59:1: exported function InPausedState should have comment or be unexported
103 lint | server/handlers/messages.go:10:1: exported function HandleMessages should have comment or be unexported
104 lint | server/handlers/runLog.go:10:1: exported function HandleRunLog should have comment or be unexported
105 lint | server/handlers/state.go:15:1: exported function HandleState should have comment or be unexported
106 lint | server/handlers/state.go:27:1: exported function GetState should have comment or be unexported
107 lint | server/handlers/state.go:32:1: exported function SetState should have comment or be unexported
108 lint | server/handlers/state.go:83:1: exported function WriteRunLog should have comment or be unexported
109 lint | server/handlers/state.go:93:1: exported function GetRunLogFile should have comment or be unexported
110 lint | tests/validate.go:33:1: exported function ValidateTimestamp should have comment or be unexported
111 lint | tests/validate.go:40:1: exported function ValidateTopic should have comment or be unexported
112 lint | tests/validate.go:46:1: exported function ValidateTopicName should have comment or be unexported
113 lint | tests/validate.go:52:1: exported function ValidateIsWhitespace should have comment or be unexported
114 lint exited with code 0
115 Aborting on container exit...
116 $ docker-compose -f docker-compose-tests.yml up --abort-on-container-exit
117 Found orphan containers (rabbitmq, orig, lint, server, obse, imed, httpserv) for this project. If you removed or renamed this
118 Starting tests ...
119 Attaching to tests
120 tests | === RUN   TestInitialGetMessageBodyFormat
121 tests | --- PASS: TestInitialGetMessageBodyFormat (10.00s)
122 tests | === RUN   TestRunLog
123 tests | --- PASS: TestRunLog (0.01s)
124 tests | === RUN   TestInitState
125 tests | --- PASS: TestInitState (10.00s)
126 tests | === RUN   TestPauseState
127 tests | --- PASS: TestPauseState (13.00s)
128 tests | === RUN   TestRunningState
129 tests | stateAPI_test.go:92: PUT RUNNING did not start message generation
130 tests | --- FAIL: TestRunningState (10.00s)
131 tests | FAIL
132 tests | FAIL      _/app/tests      43.030s
133 tests | FAIL
134 tests exited with code 1
135 Aborting on container exit...
136 ERROR: Job failed: exit code 1

```


Administrator > comp-se-140-MessageQueue > Pipelines > #28

 Pipeline #28 triggered 45 minutes ago by  Administrator

[Retry](#)


[Delete](#)

## add linter to gitlab-ci

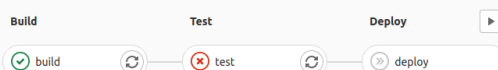
 3 jobs for main in 13 minutes and 51 seconds (queued for 1 second)



 5037a319 

 No related merge requests found.

**Pipeline** Needs Jobs 3 Failed Jobs 1 Tests 0



A successful run (test stage, other stages only contain basic output from docker):

The screenshot displays the GitLab CI/CD interface for a project named 'comp-se-140-MessageQueue'. The left sidebar contains navigation links for Project overview, Repository, Issues, Merge Requests, CI/CD (selected), Operations, Packages & Registries, Analytics, Wiki, Snippets, Members, and Settings. The main content area shows the job details for 'Job #72', which was triggered 3 minutes ago by 'Administrator' and has a status of 'passed'.

The job output is displayed in a terminal window, showing the following steps and commands:

```
1 Running with gitlab-runner 13.6.0 (8fa89735)
2 on docker-stable nU14EpUx
3 Preparing the "docker" executor
42 Preparing environment
43 Running on runner-nul4epux-project-3-concurrent-0 via gitlab-runner1...
45 Getting source from Git repository
46 Fetching changes with git depth set to 50...
47 Reinitialized existing Git repository in /builds/root/comp-se-140-MessageQueue/.git/
48 Checking out 14c75c0e as main...
49 Skipping Git submodules setup
51 Executing "step_script" stage of the job script
52 $ docker version
53 Client: Docker Engine - Community
54 Version: 19.03.8
55 API version: 1.38 (downgraded from 1.40)
56 Go version: go1.12.17
57 Git commit: afacb8b7f0
58 Built: Wed Mar 11 01:22:56 2020
59 OS/Arch: linux/amd64
60 Experimental: false
61 Server:
62 Engine:
63 Version: 18.06.3-ce
64 API version: 1.38 (minimum version 1.12)
65 Go version: go1.10.3
66 Git commit: d7080c1
67 Built: Wed Feb 20 02:27:01 2019
68 OS/Arch: linux/amd64
69 Experimental: false
70 $ docker-compose version
71 docker-compose version 1.26.2, build eefe0d3
72 docker-py version: 4.2.2
73 CPython version: 3.7.7
74 OpenSSL version: OpenSSL 1.1.1g 21 Apr 2020
75 $ docker ps
76 CONTAINER ID        IMAGE                                     COMMAND                  CREATED             STATUS              PORTS
77 3e0330f9c9d6        comp-se-140-messagequeue_orig          "/app/orig/out"         About a minute ago  Up About a minute
78 7ccd05a80681        comp-se-140-messagequeue_obse         "/app/out"              About a minute ago  Up About a minute
79 4cd939d0a1ce        comp-se-140-messagequeue_imed         "/app/imed/out"         About a minute ago  Up About a minute
80 18b0a6964d59        comp-se-140-messagequeue_server       "/app/server/out"       About a minute ago  Up About a minute   0.0.0.0:80
81 6b358f4a0e07        rabbitmq:management-alpine            "docker-entrypoint.s..." About a minute ago  Up About a minute   4369/tcp,
82 f155fb14bf06        comp-se-140-messagequeue_httpserv     "/app/out"              About a minute ago  Up About a minute   80/tcp
83 bdbbc3f78162        86e8ddd3c0dd                          "/usr/bin/dumb-init ..." 10 hours ago       Up 10 hours
84 bf1533748a73        gitlab/gitlab-ce:latest               "/assets/wrapper"       15 hours ago       Up 15 hours (healthy) 0.0.0.0:44
85 536ec7f48360        gitlab/gitlab-runner:latest           "/usr/bin/dumb-init ..." 15 hours ago       Up 15 hours
86 $ docker-compose -f docker-compose-lint.yml up --abort-on-container-exit
87 Creating network "comp-se-140-messagequeue_default" with the default driver
88 Found orphan containers (imed, server, obse, rabbitmq, httpserv, orig) for this project. If you removed or renamed this service in your
89 Creating lint ...
90 Attaching to lint
91 lint | api/messages.go:7:1: exported function GetMessages should have comment or be unexported
92 lint | api/messages.go:12:1: exported function GetMessagesBodyHandleError should have comment or be unexported
93 lint | api/runlog.go:5:1: exported function GetRunLog should have comment or be unexported
94 lint | api/runlog.go:10:1: exported function GetRunLogHandleError should have comment or be unexported
95 lint | api/state.go:11:2: don't use ALL_CAPS in Go names; use CamelCase
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99 lint | api/state.go:14:2: don't use ALL_CAPS in Go names; use CamelCase
100 lint | api/state.go:17:1: exported function ValidState should have comment or be unexported
101 lint | api/state.go:27:1: exported function GetState should have comment or be unexported
```

comp-se-140-MessageQueue

Project overview

Repository

Issues0

Merge Requests0

CI / CD

Pipelines

Jobs

Schedules

Operations

Packages & Registries

Analytics

Wiki

Snippets

Members

Settings

```
80 550ec7140300 gitlab/gitlab-runner latest /usr/bin/dumb-init - 15 hours ago up 15 hours
87 $ docker-compose -f docker-compose-lint.yml up --abort-on-container-exit
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104 lint | api/state.go:56:1: exported function PutStateHandleError should have comment or be unexported
105 lint | api/state.go:63:1: exported function GetStateHandleError should have comment or be unexported
106 lint | api/utilities.go:9:1: exported function GetResponseBody should have comment or be unexported
107 lint | api/utilities.go:26:1: exported function GetResponse should have comment or be unexported
108 lint | httpserv/httperv.go:12:1: exported function FileContents should have comment or be unexported
109 lint | orig/orig.go:50:1: exported function ShouldShutdown should have comment or be unexported
110 lint | orig/orig.go:59:1: exported function InPausedState should have comment or be unexported
111 lint | server/handlers/messages.go:10:1: exported function HandleMessages should have comment or be unexported
112 lint | server/handlers/runlog.go:10:1: exported function HandleRunLog should have comment or be unexported
113 lint | server/handlers/state.go:15:1: exported function HandleState should have comment or be unexported
114 lint | server/handlers/state.go:27:1: exported function GetState should have comment or be unexported
115 lint | server/handlers/state.go:32:1: exported function SetState should have comment or be unexported
116 lint | server/handlers/state.go:83:1: exported function WriteRunLog should have comment or be unexported
117 lint | server/handlers/state.go:93:1: exported function GetRunLogFile should have comment or be unexported
118 lint | tests/validate.go:33:1: exported function ValidateTimestamp should have comment or be unexported
119 lint | tests/validate.go:40:1: exported function ValidateTopic should have comment or be unexported
120 lint | tests/validate.go:46:1: exported function ValidateTopicName should have comment or be unexported
121 lint | tests/validate.go:52:1: exported function ValidateIsWhitespace should have comment or be unexported
122 lint exited with code 0
123 Aborting on container exit...
124 $ docker-compose -f docker-compose-tests.yml up --abort-on-container-exit
125 Found orphan containers (rabbitmq, server, orig, imed, lint, obse, httpserv) for this project. If you removed or ren
126 Creating tests ...
127 Attaching to tests
128 tests | === RUN TestInitialGetMessageBodyFormat
129 tests | ... PASS: TestInitialGetMessageBodyFormat (10.01s)
130 tests | === RUN TestRunLog
131 tests | ... PASS: TestRunLog (0.01s)
132 tests | === RUN TestInitState
133 tests | ... PASS: TestInitState (10.01s)
134 tests | === RUN TestPauseState
135 tests | ... PASS: TestPauseState (13.01s)
136 tests | === RUN TestRunningState
137 tests | ... PASS: TestRunningState (10.01s)
138 tests | PASS
139 tests | ok _/app/tests 43.035s
140 tests exited with code 0
141 Aborting on container exit...
142 $ docker-compose -f docker-compose-tests-shutdown.yml up --abort-on-container-exit
143 Found orphan containers (imed, tests, server, httpserv, rabbitmq, orig, obse, lint) for this project. If you removed
144 Creating tests-shutdown ...
145 Attaching to tests-shutdown
146 tests-shutdown | === RUN TestShutdownState
147 tests-shutdown | ... PASS: TestShutdownState (5.08s)
148 tests-shutdown | PASS
149 tests-shutdown | ok _/app/tests/shutdown 5.082s
150 tests-shutdown exited with code 0
151 Aborting on container exit...
152 Job succeeded
```

Administrator > comp-se-140-MessageQueue > Pipelines > #31

passed Pipeline #31 triggered 9 minutes ago by Administrator

Delete

## fix shutdown test, put state expected to die

3 jobs for main in 7 minutes and 42 seconds (queued for 1 second)

latest

14c75cce

No related merge requests found.

Pipeline Needs Jobs 3 Tests 0

