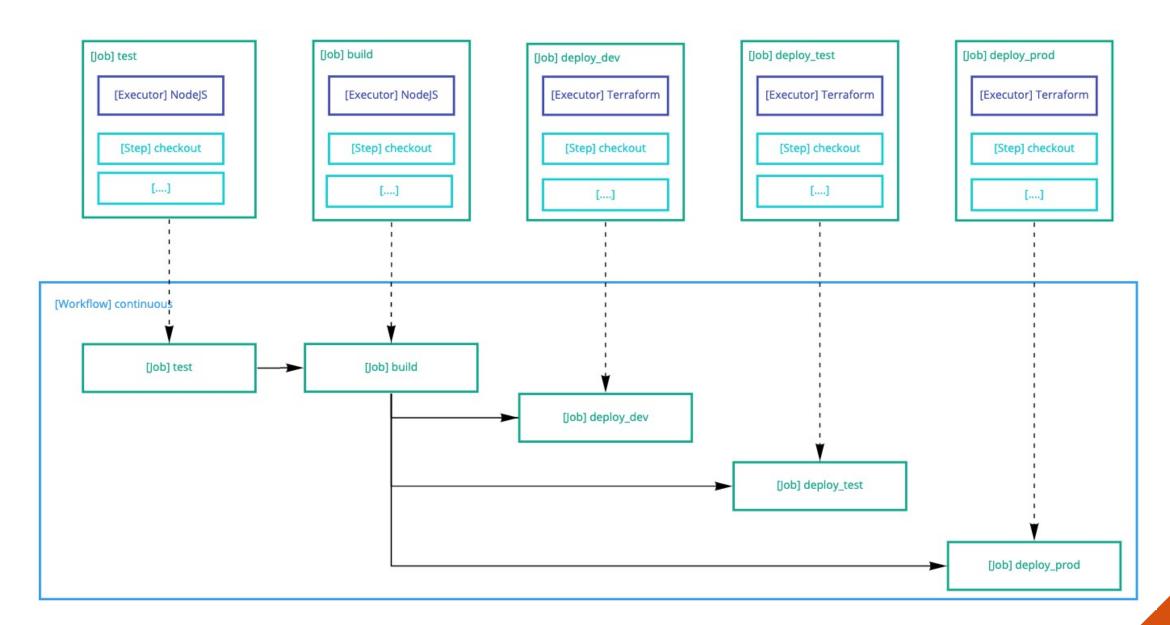
CircleCI Orbs

What are orbs? Why do we use them at TrustedShops? How do I create new ones?

Circleci Basics 101

Basic Pipeline | Overview



Basic Pipeline | Code 1/2

```
version: 2.1
jobs:
 build:
    executor:
      docker:
        - image: cimg/node:lts
    steps:

    checkout

      - restore_cache:
          key: node-modules-{{ checksum package-lock.json }}
      - run:
          name: Install dependencies
          command: npm install
      - save_cache:
          key: node-modules-{{ checksum package-lock.json }}
          name: Build
          command: npm run build
      - persist_to_workspace:
          root: .
          paths:
           - dist/
    test:
      executor:
        docker:
          - image: cimg/node:lts
      steps:
        - checkout
        - restore_cache:
            key: node-modules-{{ checksum package-lock.json }}
        - run:
           name: Install dependencies
           command: npm install
        - save_cache:
            key: node-modules-{{ checksum package-lock.json }}
            name: Run unit tests
            command: npm run test
```

Basic Pipeline | Code 2/2

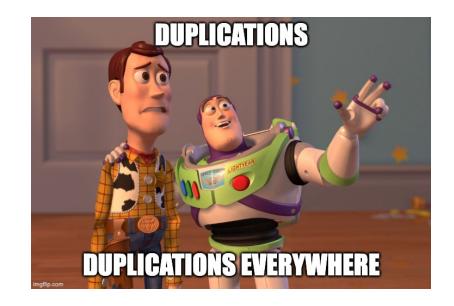
```
# ...
jobs:
 deploy_dev:
    executor:
     docker:
       - image: terraform:1.0
    steps:

    checkout

         name: Initialize terraform
         command: |
           cd terraform
           terraform init
         name: Apply
         command:
           terraform apply -var-file=vars/dev.tfvars -auto-approve=yes
   deploy_test:
     executor:
       docker:
          - image: terraform:1.0
       - checkout
       - run:
           name: Initialize terraform
           command: |
             cd terraform
             terraform init
       - run:
           name: Apply
           command:
             cd terraform
             # same story again, just different var-file
             terraform apply -var-file=vars/test.tfvars -auto-approve=yes
    deploy_prod:
     executor:
       docker:
          - image: terraform:1.0
       - checkout
       - run:
           name: Initialize terraform
           command:
             cd terraform
             terraform init
       - run:
           name: Apply
           command: |
             cd terraform
             # same story again, just different var-file
             terraform apply -var-file=vars/prod.tfvars -auto-approve=yes
```

Whats wrong?

- duplicated executors and also versions!
- duplicated checkout, install dependencies
- duplicated deployment jobs
- hard to read and update



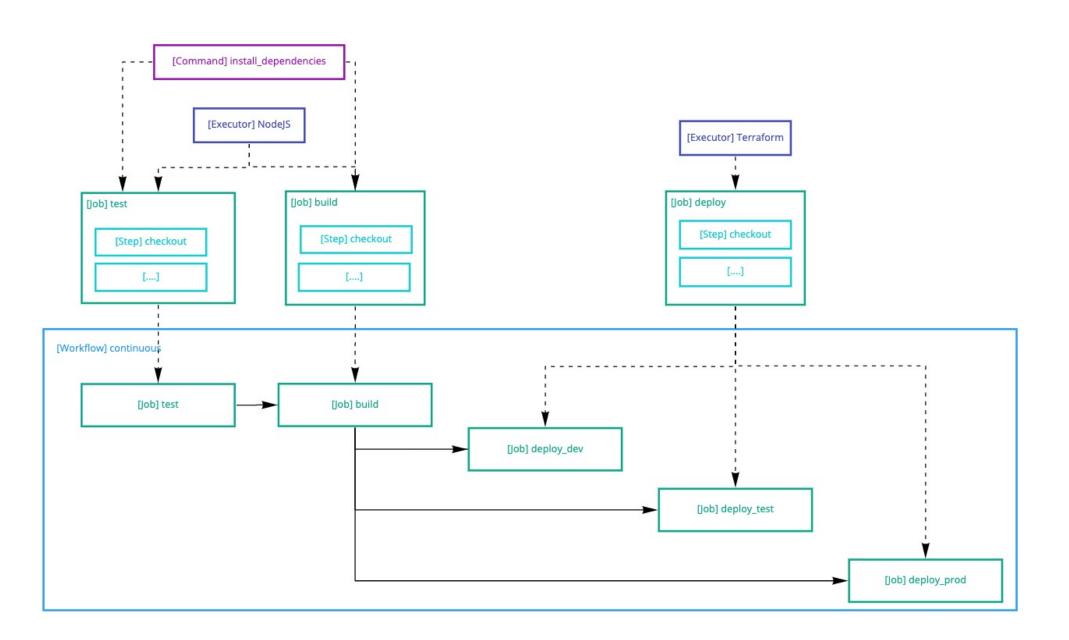
What can be done about it?

- YAML anchors?
- more shell scripts?
- task runner?

No, its even easier!

- executors
 - o define once, use as often as you want
- commands
 - o reusable steps
 - o parameterizable
- jobs
 - o can also have parameters!

Reusable pipeline | Overview



Reusable pipeline | Code 1/2

```
version: 2.1
executor:
  node:
    docker:
      - image: node:lts
  terraform:
    docker:
      - image: terraform:1.0
commands:
  install_dependencies:
    steps:
      - restore_cache:
          key: node-modules-{{ checksum package-lock.json }}
      - run:
          name: Install dependencies
          command: npm install
      - save cache:
          key: node-modules-{{ checksum package-lock.json }}
```

Reusable pipeline | Code 2/2

```
jobs:
 build:
    executor: node
    steps:

    checkout

      - install_dependencies
      - run:
          name: Build
          command: npm run build
      - persist_to_workspace:
          root: .
          paths:
            - dist/
    test:
      executor: node
      steps:

    checkout

        - install_dependencies
        - run:
            name: Run unit tests
           command: npm run test
      deploy:
        executor: terraform
        parameters:
          env:
            type: string
           description: Environment to deploy
        steps:
          - checkout
          - run:
              name: Initialize terraform
              command: |
                cd terraform
                terraform init
          - run:
              name: Apply
              command: |
                cd terraform
                terraform apply --var-file vars/<<parameters.env>>.tfvars -auto-approve=yes
# ...
```

Reusable pipeline | Call parameterized workflow in job

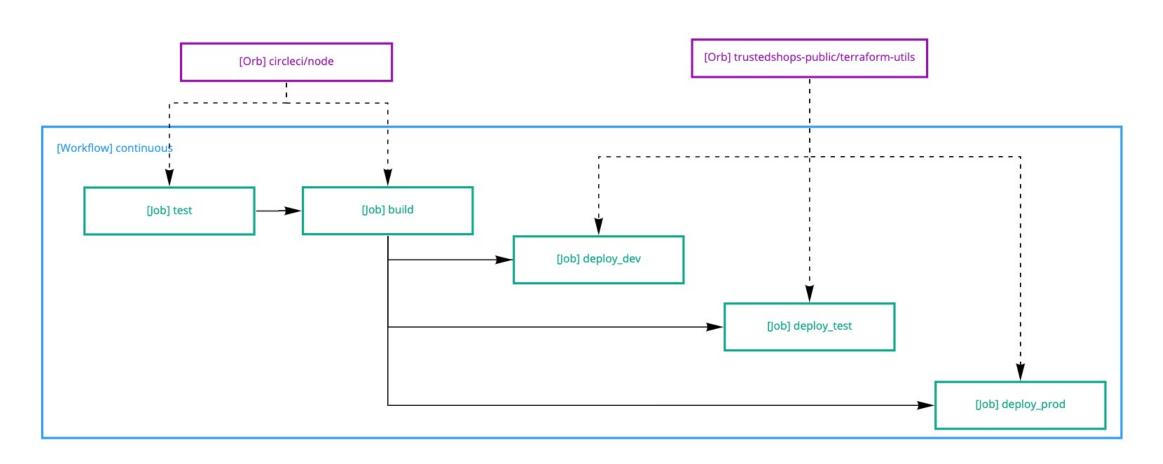
```
workflows:
   continuous:
    jobs:
     # ...
     - deploy:
        name: deploy-test
        env: test
     # ...
```

Wouldn't it be great to have drop-in solutions for this?

There comes CircleCI Orbs!

- semantic versioned
- versions are immutable, so there a no surprises
- can contain building blocks for your pipelines:
 - executors
 - o commands
 - o jobs

"Orbified" pipeline | Overview



"Orbified" pipeline | Code

```
version: 2.1
anchors:
 terraform-defaults: &terraform_defaults
   terraform-version: 1.0.11
   path: terraform
orbs:
 terraform-utils: trustedshops-public/terraform-utils@1.5.0
 node: circleci/node@4.7.0
workflows:
 continuous:
   jobs:
      - node/test:
         name: test
      - node/run:
         name: build
         npm-run: build
         requires:
           - test
      - terraform-utils/terraform-apply:
         name: deploy dev
         <<: *terraform defaults
         var-file: vars/dev.tfvars
         requires:
           - build
         # filters, contexts ..
      - terraform-utils/terraform-apply:
         name: deploy test
         <<: *terraform_defaults
         var-file: vars/test.tfvars
         requires:
           - build
         # filters, contexts ..
      - terraform-utils/terraform-apply:
         name: deploy_prod
         <<: *terraform defaults
         var-file: vars/prod.tfvars
         requires:
           - build
         # filters, contexts ..
```

Where to find them

- via google (circleci orb search term)
- https://circleci.com/developer/orbs
- in the trustedshops-public org, search for repos starting with circleci-orb-

Creating orbs at TrustedShops has never been easier!

- create a repository in the trustedshops-public org with the help from someone in the OpenSource Guild
- cookiecutter gh:trustedshops-public/cookiecutter-circleci-orb
- enter the name of the orb
- develop your orb, batteries included with a preconfigured CircleCI pipeline
 - automatic releases on semantic commits
 - snapshots on feature branches to test your orbs before publishing them
- After approval with someone from @trustedshops-public/circleci-orbs the orb will be published

Orb source structure

You can write orbs a single YAML, but that's no fun.

So orbs are split into multiple files and bundled at deploy time:

```
|- src
|- commands
|- command-name.yml
|- examples
|- example-name.yml
|- jobs
|- job-name.yml
|- executors
|- executor-name.yml
|- scripts
|- script-to-source.sh
```

Each of the directories is optional.

Orbs - The ugly

- once published there is no way back the orb can only be deleted in special cases by support
- only admin can create and update orbs (TPS DevOps team built a workaround for that)

Best Practices

Best Practices | Using orbs

- prefer orbs over inline solutions
- only use official, certified or our own orbs
- upgrade orbs from time to time

Best Practices | Creating orbs

- use official orbs functionality as base when possible (e. g. aws cli)
- create commands for building blocks
- a job should also be executable using commands from the orb
- pass parameters through with the same defaults
- provide at least one example per job and one to use composite commands
- do one thing and do it good
- make the orb flexible with parameters but provide sensitive defaults
- keep it generic and free from "TrustedShops specials"

Further resources

CircleCI

- circleci.com/orbs
- circleci.com/docs/2.0/orb-intro

Publishing Orbs at TS

• trustedshops/tps-operations-guidelines/CI_CD/CircleCI/ORBS.md

End

