



全球云计算开源大会 2017

中国·北京

聚合云计算新势力，拥抱全世界新开源

GLOBAL CLOUD COMPUTING OPEN SOURCE CONFERENCE(GCCOSC)

# ContainerOps – DevOps Orchestration





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# Agenda



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1. The story of DevOps
2. What' s the DevOps
3. The ContainerOps Concept – Defining/Drawing/Running
4. What' s the DevOps Component
5. The ContainerOps core – DevOps Workflow Engine
6. A user case of ContainerOps



# DevOps Story



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- **2007** - While consulting on a data center migration for the Belgium government, system administrator Patrick Debois becomes frustrated by conflicts between developers and system admins. He ponders solutions.
- **Agile Conference 2008 in Toronto** - Andrew Clay Shafer's "*birds of a feather*" ad hoc session called Agile Infrastructure. The only person who showed up was Patrick Debois. Shafer and Debois started a Google group called "*Agile System Administration*"
- **O'Reilly Velocity 2009 Conference** - Presentation at Velocity of *10+ Deploys per Day: Dev and Ops Cooperation at Flickr* by John Allspaw and Paul Hammond – Debois watched by streaming video, tweeted.
- **October 2009** - Organized through Twitter. Conversation continued on Twitter and the #DevOps hashtag was born, dropping "*Days*" for brevity.
- **2010 Mountain View, CA** - *DevOpsDays*
- **Mar. 2011** - Gartner's first notes about DevOps
- **April 2012** - In an InfoQ video interview, Debois admitted that naming the movement was not as intentional as it might seem: "I picked '*DevOpsDays*' as Dev and Ops working together because '*Agile System Administration*' was too long," he said. "*There never was a grand plan for DevOps as a word.*"



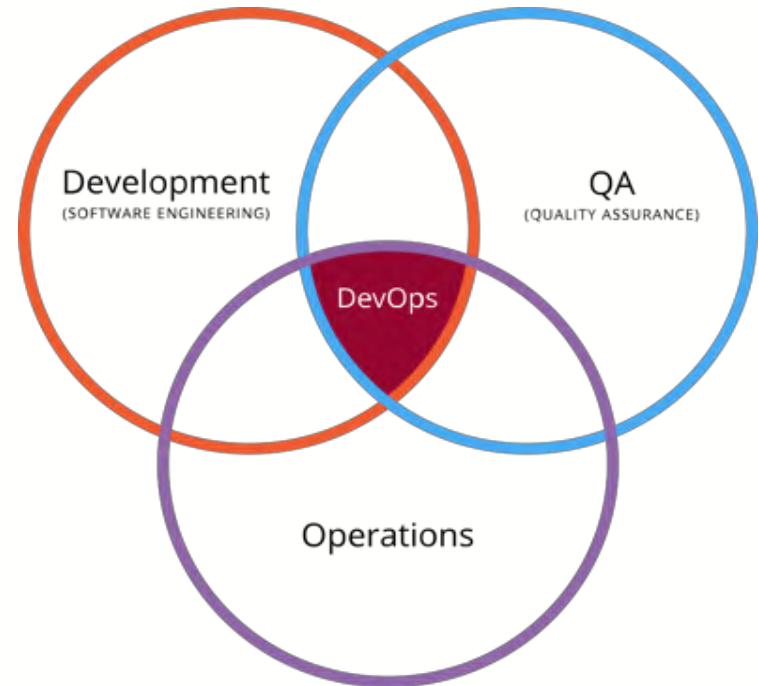
# What's the DevOps?



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*DevOps is "a portmanteau of 'development' and 'operations'" and is "a software development method that stresses communications, collaboration, integration, automation and measurement of cooperation between software developers and other IT professionals".*

*-From Wikipedia*



DevOps is an operational philosophy that promotes better communication between development and operations as more elements of operations become programmable.



# What' s the DevOps ultimate AIM?



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Goal ->

The ultimate is break down barriers between developer, QAs and operators.

How ->

- Define the operation environment at development stage.
- Define the process from development to the production.
- Automate everything.



# Why improve so hard?



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- Don't break the original DevOps workflow.
- Add DevOps orchestration tool adaptive the workflow.
- Improve the process with customize DevOps task.
- Add DevOps service like Travis CI.
- Everyone is happy!!!



# ContainerOps - DevOps Orchestration



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Defining -> Component

Drawing -> Workflow

Running -> Container Orchestration

Open Source @ ->

<https://github.com/Huawei/containerops>





# Defining Component - Container Image For DevOps

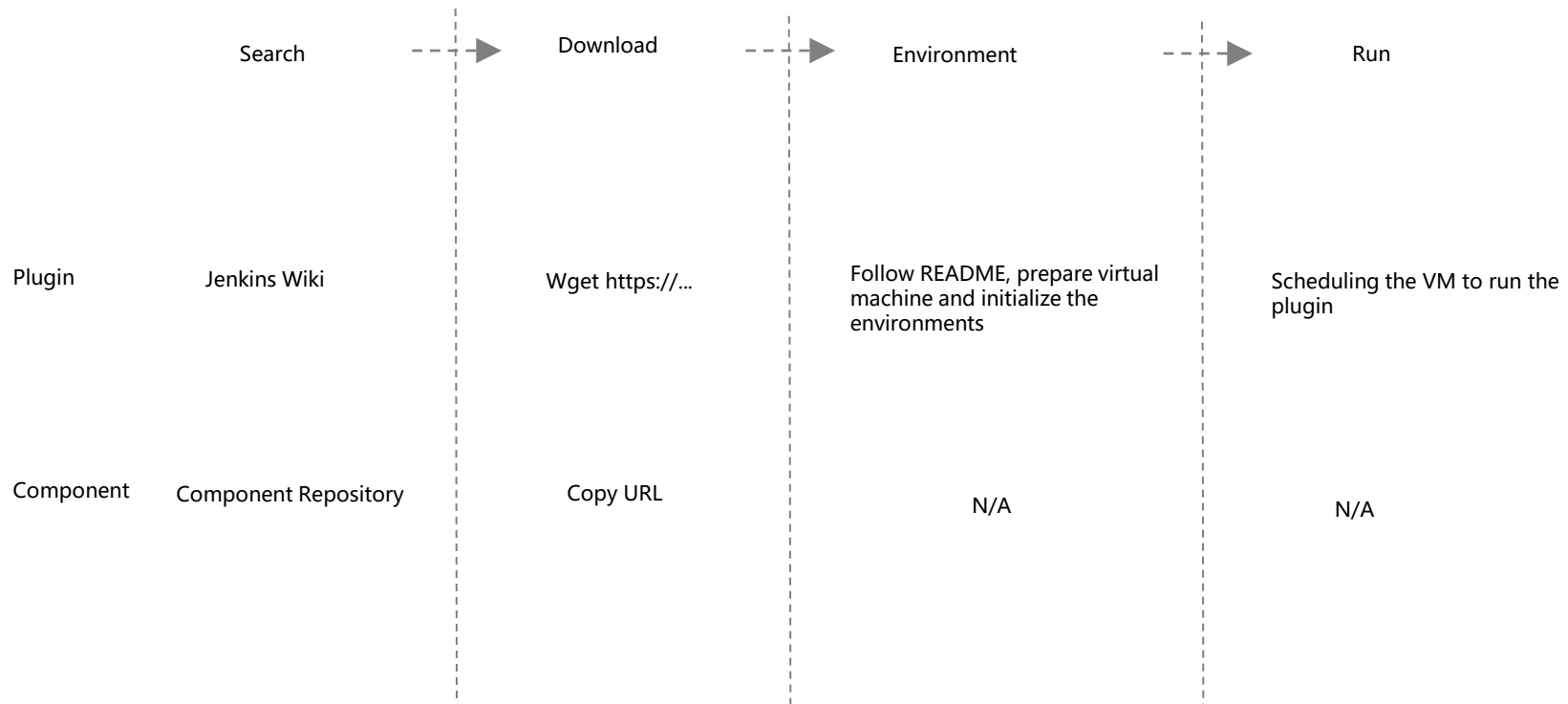


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1. Encapsulating your DevOps task in a container image.
2. Defining the input & output data.
  - a. Data type is Key/Value
  - b. Input data with environment variables. Reserved environment variable name is [CO\_DATA].
  - c. Output data in the stdout/stderr, the reserved environment variable name is [CO\_RESULT].
  - d. Output data format [COUT] CO\_RESULT = true/false .
  - e. Base image is phusion/baseimage .
3. Management the component lifecycle in the ContainerOps system.

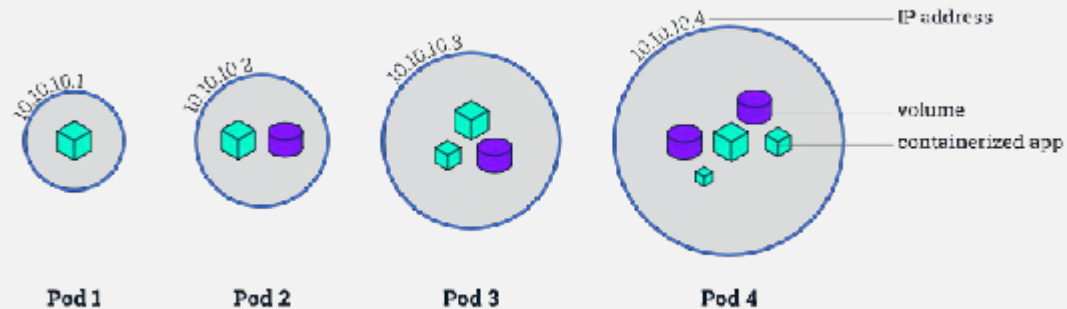
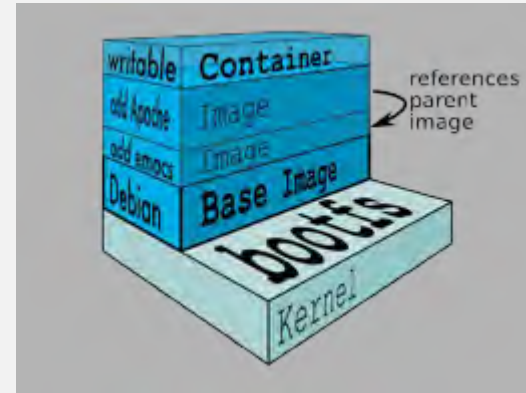


# Why Use DevOps Component?



# Why A Component Not A Pod?

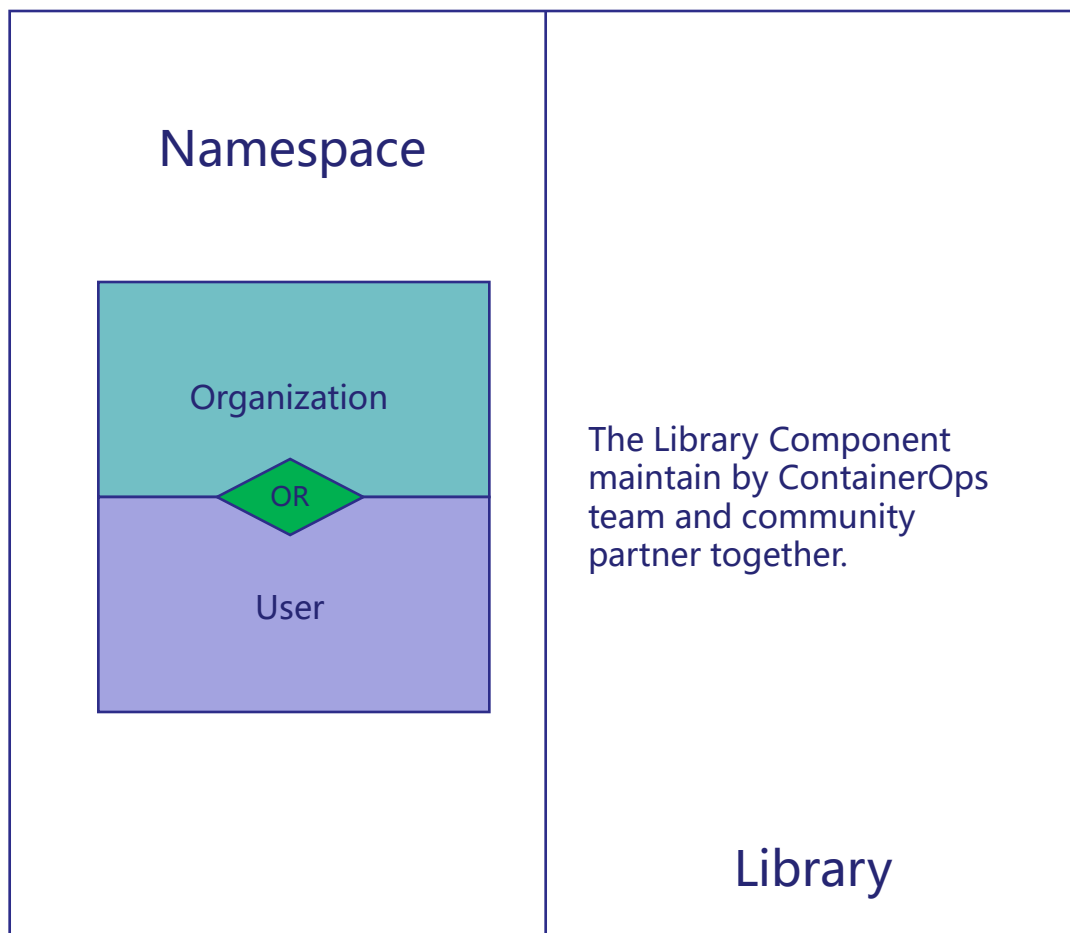
1. Adaptive other container orchestration system like Docker Swarm.
2. Only one task in the component to easily maintain and share.



# Component Namespace



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# Component Repository



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UI

Component Repository

Container Registry

[<https://github.com/Huawei/dockyard>]



# Component Architecture



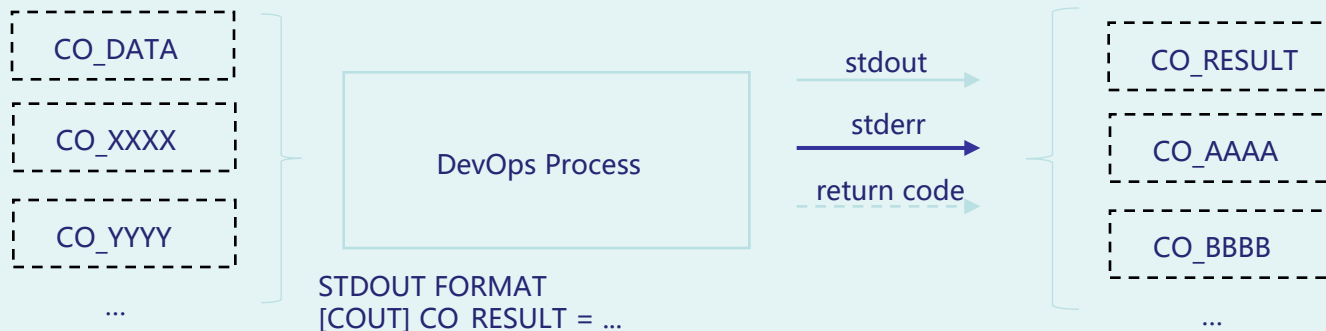
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## Antilog

### Docker

Collect log using "docker logs -f -t --details ContainerID "

Reserved environment variable [CO\_DATA] for transfer data into container, user could define more variables and we suggest all variable name prefix with [CO\_].



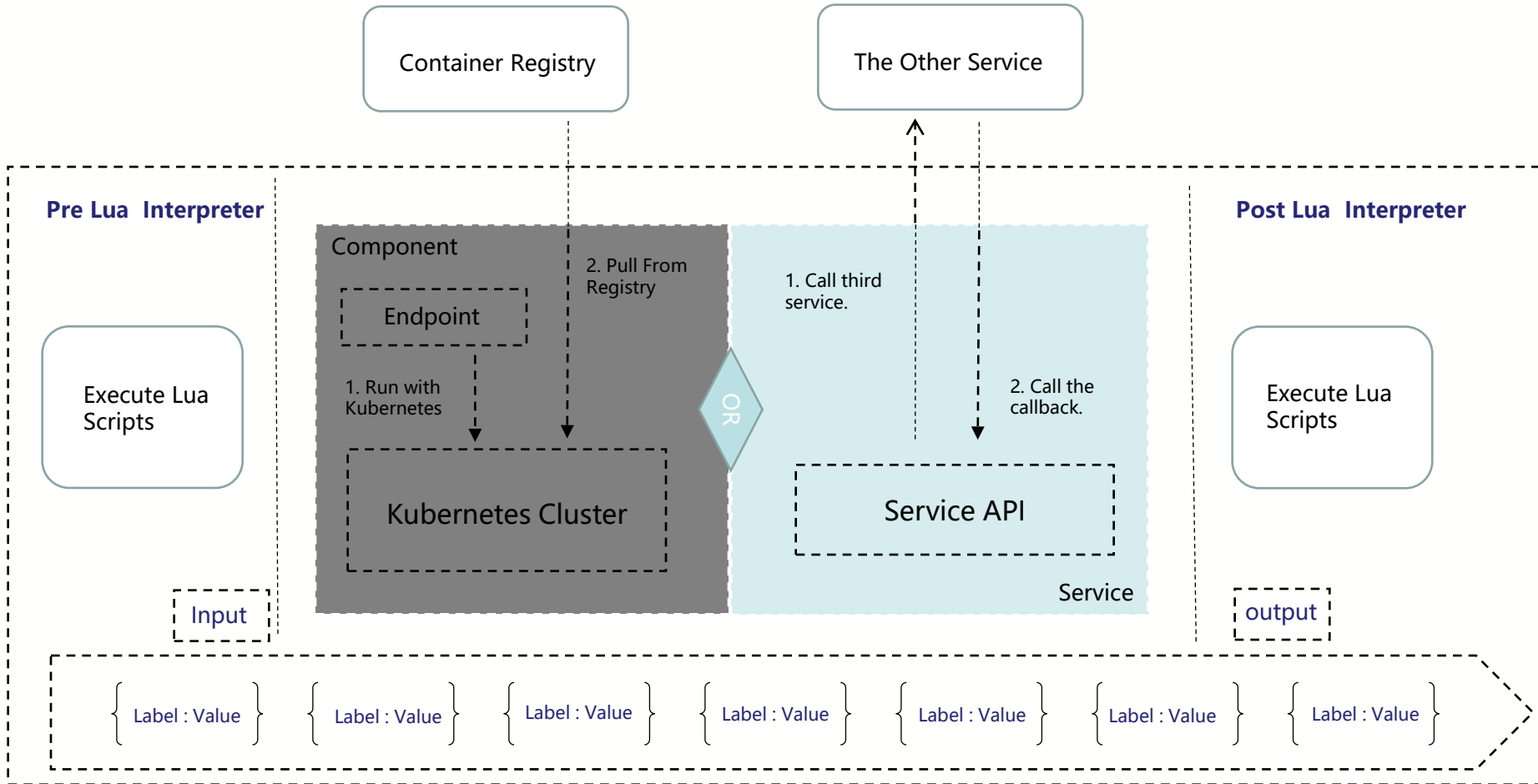
[Base Image] <https://hub.docker.com/r/phusion/baseimage>







# Workflow Engine - Job





## Container Ops

Component

Workflow

Dockerfile

Workflow Information

Edit Data Map Link

Run History Info

+ Create New One

Setting

Check

Save



Component Name

Close

Runtime Config

Image Info

Debug

Base Config

100 / s

Design

Base Image

Repository Name

Image Tag

Kubernetes

CPU Limits - 0.25

CPU Requests - 0.8

Memory Limits - 1024

/ Mi

Memory Requests - 128

/ Mi





Container Ops

[User](#)
[Organization](#)

Project Workflow Info Edit Data Map Link Run History Info

[Create New One](#)
[Setting](#)
[Check](#)
[Save](#)

Component

Workflow

Dockerfile

running Job #10050039 in pipeline #5098046 for commit feb23890 from 20389-us-problem-with-pipeline-coverage-placeholder by Avatar about 2 hours ago

```

Running with gitlab-ci-multi-runner 1.10.4 (632525f)
Using Docker executor with image dev.gitlab.org:5005/gitlab-build-images-ruby-2.3.3-git-2.7-phantomjs-2.1-node-7.1 ...
Starting service mysqltest ...
Pulling docker image mysqltest ...
Starting service redisalpine ...
Pulling docker image redisalpine ...
Waiting for services to be up and running...
Pulling docker image dev.gitlab.org:5005/gitlab-build-images-ruby-2.3.3-git-2.7-phantomjs-2.1-node-7.1 ...
Running on runner-3062039-project-13883-concurrent-8 via runner-3062039-auto-scale-1437668434-2nc379c...
Cloning repository for 20389-us-problem-with-pipeline-coverage-placeholder with git depth set to 20...
Cloning into 'bullet/gitlab-org/gitlab-ce'...
Checking out feb23890 as 20389-us-problem-with-pipeline-coverage-placeholder...
Skipping Git submodules setup
Downloading artifacts for knapsack (38857945)...
Downloading artifacts from coordinator... ok      id=16857945 responseStatus=200 OK token=lvx3Jd
Downloading artifacts for setup-test-env (18818074)...
Downloading artifacts from coordinator... ok      id=18818074 responseStatus=200 OK token=2dQK_38
WARNING: tmp/test/gitlab-shell/gitlab_shell_secret: chmod tmp/test/gitlab-shell/gitlab_shell_secret: no such file or directory (suppressing reports)
Checking cache for ruby-233...
Successfully extracted cache
$ source ./scripts/prepare_build.sh
$ cp config/gitlab.yml.example config/gitlab.yml
$ bundle --version
Bundler version 1.14.4
$ if [ "$DOZ_SOME_INSTALL" = "true" ] || retry bundle install --without postgres production --jobs $(nproc) $!&&
$ retry gem install knapsack
Successfully installed timecop-0.8.1
Successfully installed knapsack-1.13.1
2 gems installed
$ [ "$SETUP_DB" = "true" ] || bundle exec rake db:drop db:create db:schema:load db:migrate add_limits_mysql
Database 'gitlabhq_test' does not exist
Missing Rails.application.secrets.secret_key_base for test environment. The secret will be generated and stored in config/secrets.yml.
Missing Rails.application.secrets otp_key_base for test environment. The secret will be generated and stored in config/secrets.yml.
Missing Rails.application.secrets.db_key_base for test environment. The secret will be generated and stored in config/secrets.yml.
-- enable_extension('pgcrypto')
-> 0.003s

knapsack global time execution for tests: 39m 29s

Finished in 50 minutes 20 seconds (files took 59.81 seconds to load)
887 examples, 0 failures

Creating cache ruby-233...
Created cache
Uploading artifacts...
knapsack: found 4 matching files
coverage: found 5 matching files
Uploading artifacts to coordinator... ok      id=16858030 responseStatus=201 Created token=7H0r5-9
Build succeeded
        
```



# TiDB/TiKV/PB Case

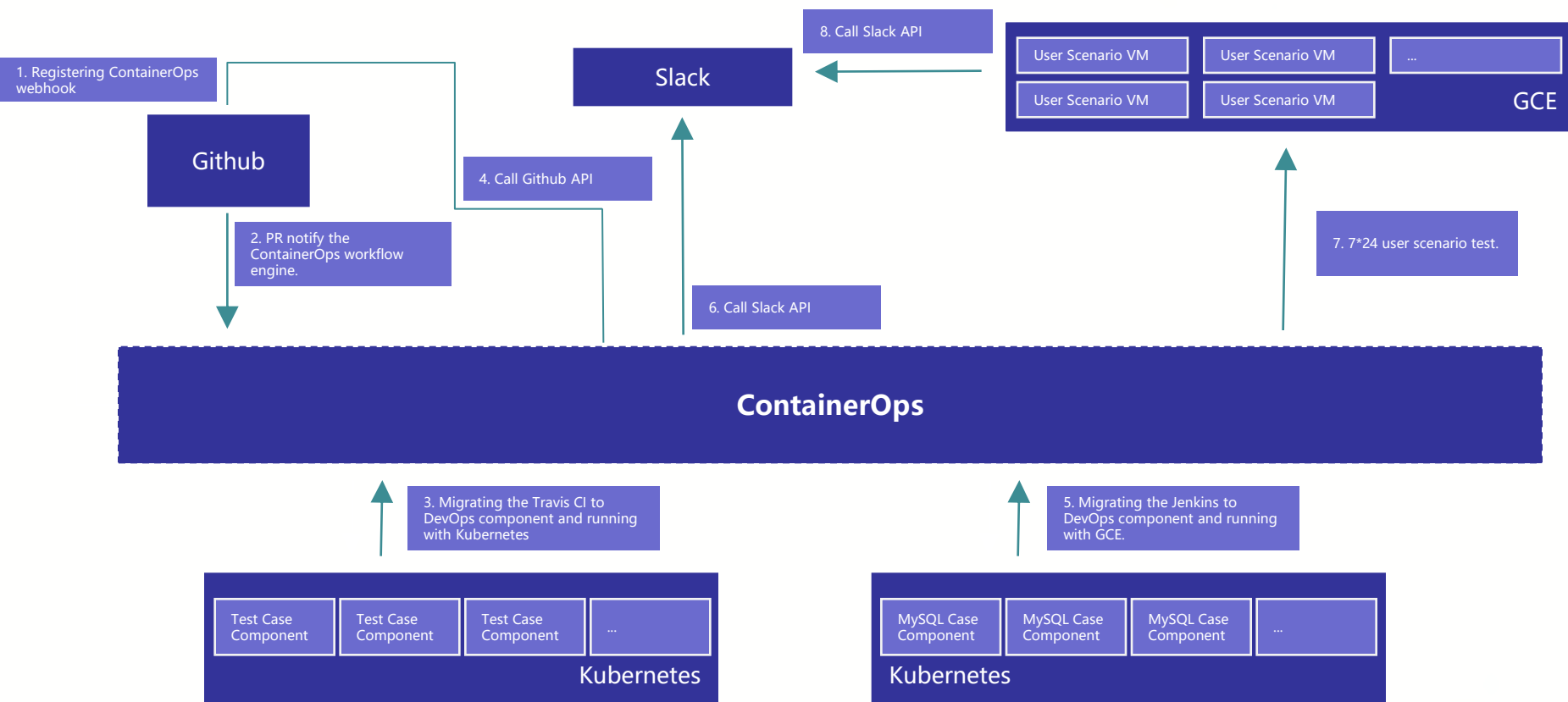


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3 DevOps Stage with different systems:

1. Test case Within Travis CI
2. Merge Stage: 10000000+ MySQL test case with Jenkins.
3. Release Stage: 7\*24 hours user scenario with manual.







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# Thanks & End

