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# Debugging Zuul jobs – now easier than ever, with Autoholds feature



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# Completely new to Zuul CI?

>> **Watch our quick-start introduction!**



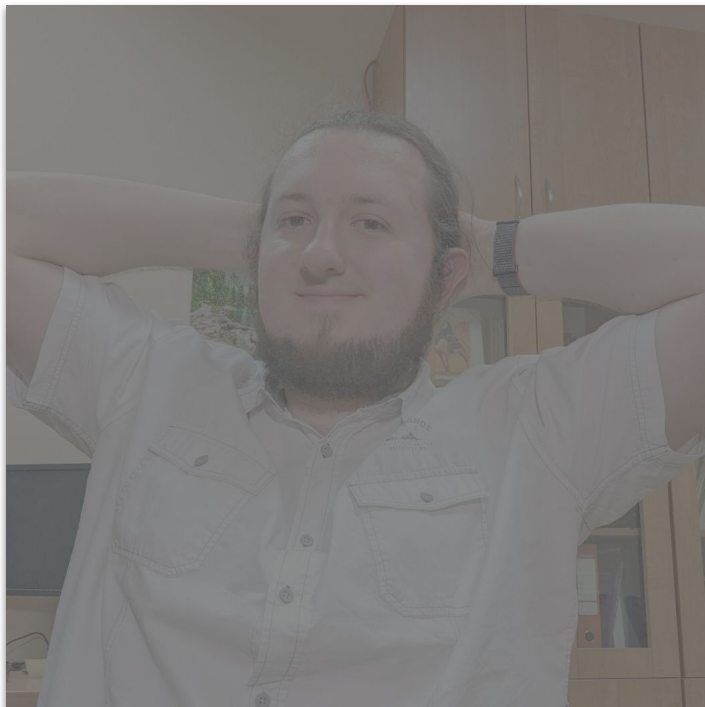
<https://www.openstack.org/videos/summits/shanghai-2019/zuul-the-third-throws-away-any-dirt-a-quick-start-introduction>

## >> In short: What is Zuul CI?

- Project **gating** system.
- Solution for **Continuous Integration**, as well as for **Continuous Delivery**.
- Relies on **Ansible** playbooks/roles.
- Supports cross-project **dependencies**.
- Drives one of the largest CI system in the open source world – **OpenDev!**



## >> Motivation (0/4)



## >> Motivation (1/4)

**I DID IT, BOSS!**



**I FINISHED  
THE NEW FEATURE**



## >> Motivation (2/4)

**I DID IT, BOSS!**

1



**I FINISHED  
THE NEW FEATURE**

**THAT'S GREAT, SIR**

2



**BUT WHY ARE THERE  
FAILING TESTS?**

## >> Motivation (3/4)

**I DON'T KNOW WHY**



**BUT IT WORKS  
ON MY COMPUTER**



## >> Motivation (4/4)

**I DON'T KNOW WHY**



**BUT IT WORKS  
ON MY COMPUTER**

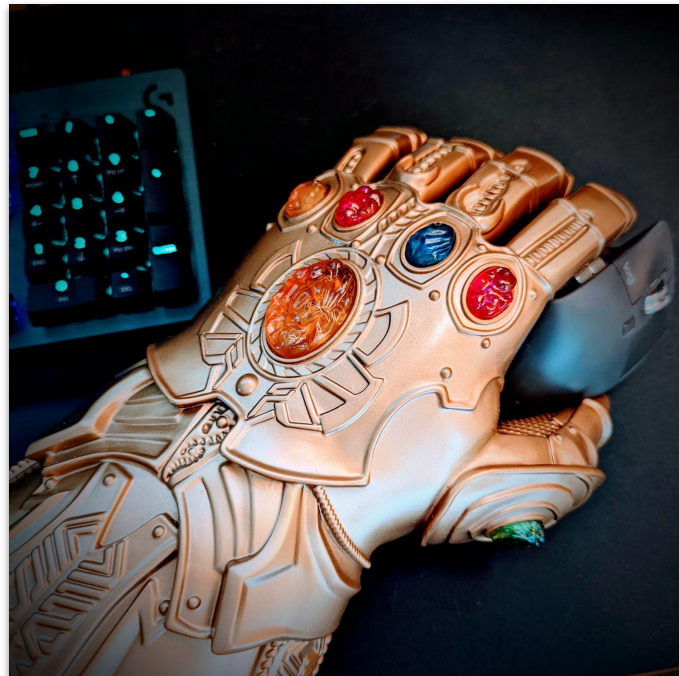
**THEN WE WILL SEND  
YOUR COMPUTER**



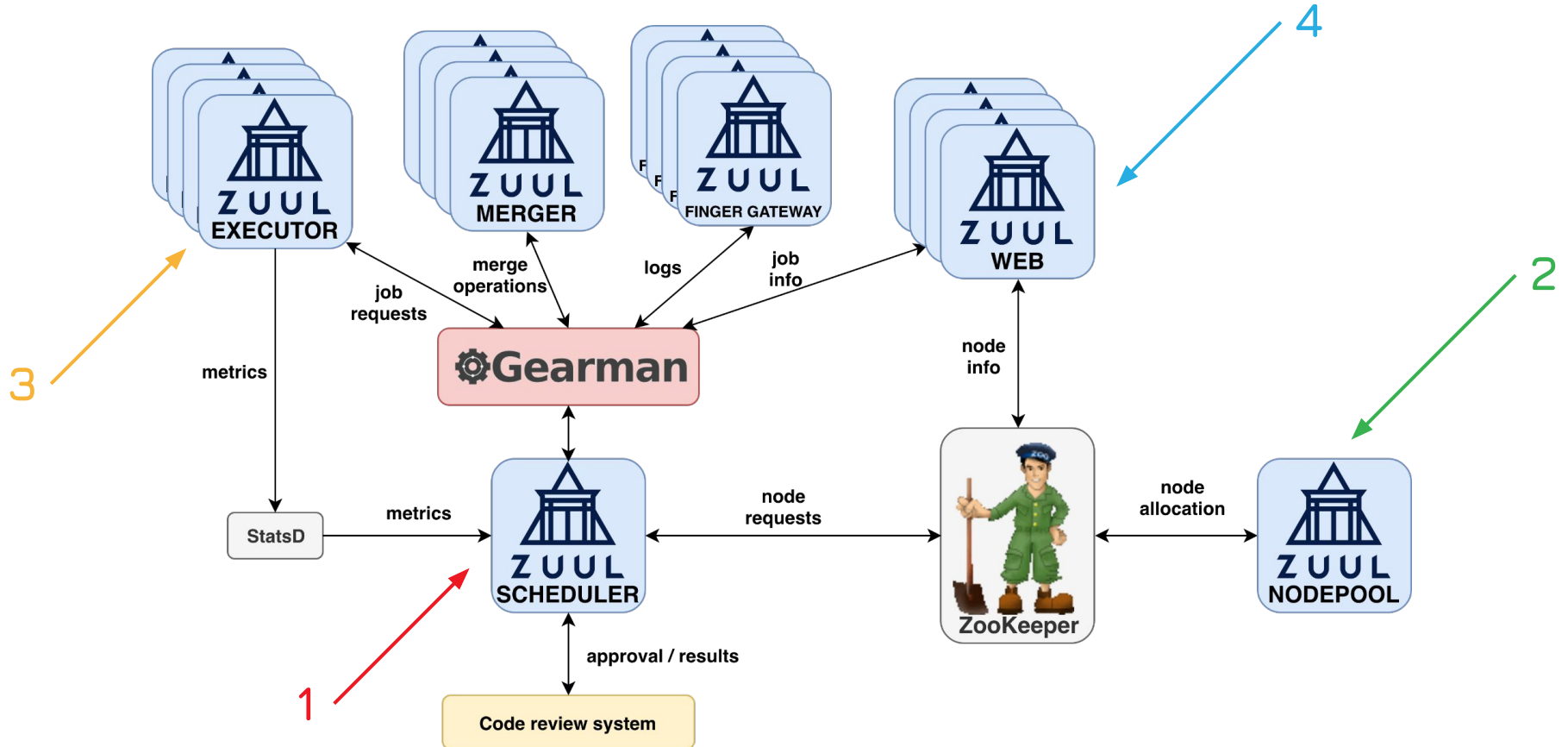
**TO THE CUSTOMER**

## >> Motivation: getting into test environment...

- **Reality** is often disappointing...
- **Testing** environment **differs** from development, even though we attempt to make it the same...
  - \* **Software** versions.
  - \* **Hardware** revisions.
  - \* **Firmware** releases.
  - \* **Configuration** of all above...
- Reproducing the **issue** is **not** always **easy**.
- Getting **>into<** the testenv may be **convenient**.



## >> Typical Zuul operation

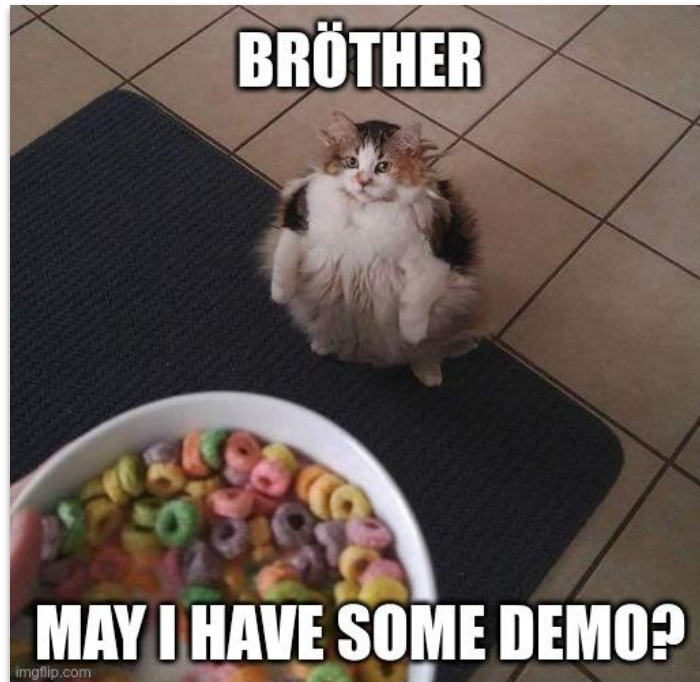


## >> Autoholds mechanism explained

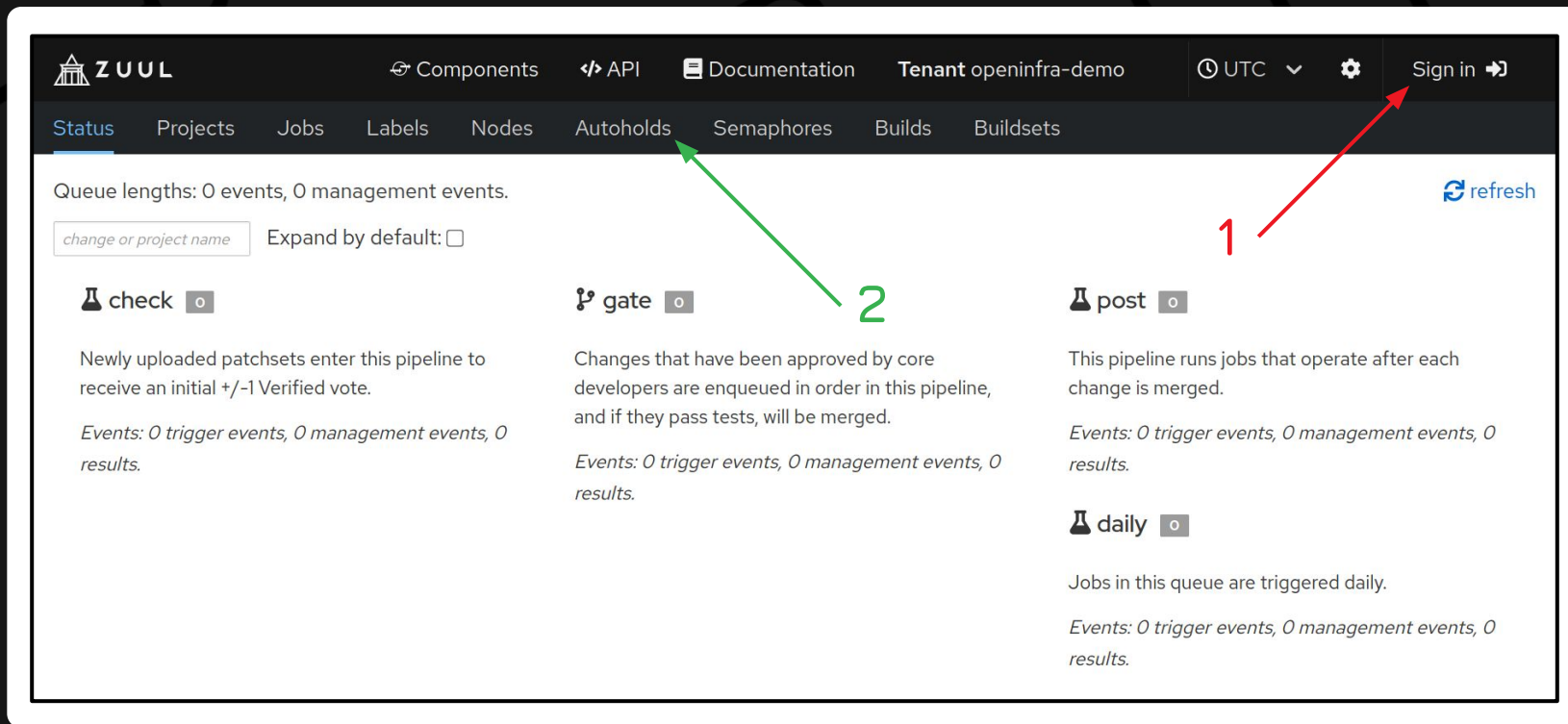
- A mechanism that **preserves the nodes** involved in Zuul builds.
  - \* Delays the cleanup by **a given amount of time**.
  - \* Provided that the **build did fail** on this node.
- Offers **a clear way to get into the test environment**.
- It is actually not a new feature!
  - \* **Implemented** early in Zuul v3 development: (July 2017)  
<https://review.opendev.org/c/zuul/zuul/+486692>
  - \* **Recently** made available in Zuul Web UI: (November 2021)  
<https://review.opendev.org/c/zuul/zuul/+768199>
  - \* **Official** announcement: (February 2022)  
<https://superuser.openinfra.dev/articles/zuul-5-0-is-here/>



## >> Quasi-demo™



# >> Quasi-demo™: Zuul homepage



**ZUUL** Components API Documentation Tenant openinfra-demo UTC UTC Sign in

Status Projects Jobs Labels Nodes Autoholds Semaphores Builds Buildsets

Queue lengths: 0 events, 0 management events. [refresh](#)

Expand by default: ☐

**check**

Newly uploaded patchsets enter this pipeline to receive an initial +/-1 Verified vote.

Events: 0 trigger events, 0 management events, 0 results.

**gate**

Changes that have been approved by core developers are enqueued in order in this pipeline, and if they pass tests, will be merged.

Events: 0 trigger events, 0 management events, 0 results.

**post**

This pipeline runs jobs that operate after each change is merged.


Events: 0 trigger events, 0 management events, 0 results.


**daily**

Jobs in this queue are triggered daily.

Events: 0 trigger events, 0 management events, 0 results.

# >> Quasi-demo™: Autoholds tab


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[+ Create Request](#)

ID

Project


Job

Ref Filter

# Triggers

Reason

Hold for



No autohold requests found

Nothing to display.

# >> Quasi-demo™: Autoholds – request pop-up

Create an Autohold Request

×

Project \*

some project

The project for which to hold the next failing build

Job \*

some job

The job for which to hold the next failing build

Change

The change for which to hold the next failing build

Ref

The ref for which to hold the next failing build

Reason \*

Requested from the web UI for debugging...

A descriptive reason for holding the next failing build

Count \*

1

How many times a failing build should be held

Node Hold Expires in (s) \*

86400

How long nodes should be kept in HELD state (seconds)

Create

Cancel


**Project, Job, Change and Ref:**  
filter what builds you may want to hold.


**Reason:**  
let admins know why you keep the node ;-)

**Count:**  
how many times the node will be held.

**Node Hold Expires in:**  
how long the node will be kept online.


# >> Quasi-demo™: Autoholds tab once again

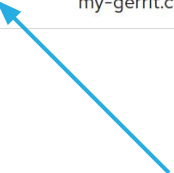

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[+ Create Request](#)

ID	Project	Job	Ref Filter	# Triggers	Reason	Hold for
<a href="#">0000000001</a>	my-gerrit.com/my-project	unit-tests	.*	0/1	Investigating bug XYZ	a day 


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# >> Quasi-demo™: Autohold details



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## Autohold Request 0000000001


 Project [my-gerrit.com/my-project](#)


 Filter `*`

 Job [unit-tests](#)


 Trigger Count 0 out of 1
 


5

 Hold Duration a day

 Reason:
 

Investigating bug XYZ


 Held Builds



6


This autohold request has not triggered yet.


# >> Quasi-demo™: Autohold details after trigger


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## Autohold Request 0000000001



Project [my-gerrit.com/my-project](#)


Filter . \*



Job [unit-tests](#)


Trigger Count 1 out of 1


Hold Duration a day


Reason:

Investigating bug XYZ



Held Builds

d41d8cd98f00b204e9800998ecf8427e

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# >> Quasi-demo™: Build details


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✖ unit-tests
FAILURE
📌
9

🔗 [Change 123456,7](#)
📅 Started at 2023-06-14 09:50:00
📄 View job documentation

📦 Project my-project
🕒 Completed at 2023-06-14 10:05:00
🕒 View build history

🔑 Branch master
🕒 Took 15 mins 0 secs
📄 View buildset result

☰ Pipeline check
📄 View log
🔒 Autohold future build failure(s)

📡 UUID

d41d8cd98f00b204e9800998ecf8427e

Event ID

e7cf737ee5004ce284c407aa7957b275

📊 Task Summary
📄 Artifacts
📄 Logs
🔍 Console

node01


✖ 59 OK
38 Changed
1 Failure

localhost

✔ 6 OK
2 Changed

10

# >> Quasi-demo™: Next steps...

 Project my-project

 Took 15 mins 0 secs

 [View build history](#)

 Branch master

 [View buildset result](#)

 Pipeline check

 [View log](#)

 UUID

 [Autohold future build failure\(s\)](#)

d41d8cd98f00b204e9800998ecf8427e

Event ID

e7cf737ee5004ce284c407aa7957b275

 Task Summary

 Artifacts

 Logs

 Console

[Logs](#) > [zuul-info](#) > [inventory.yaml](#)

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[All](#) [Debug](#) [Info](#) [Warning](#) [Error](#) [Trace](#) [Audit](#) [Critical](#)

```
1 all:
2   hosts:
3     node01:
4       ansible_connection: ssh
5       ansible_host: 10.12.34.56
6       ansible_port: 22
7       ansible_python_interpreter: auto
8       ansible_user: zuul
9       nodepool:
```

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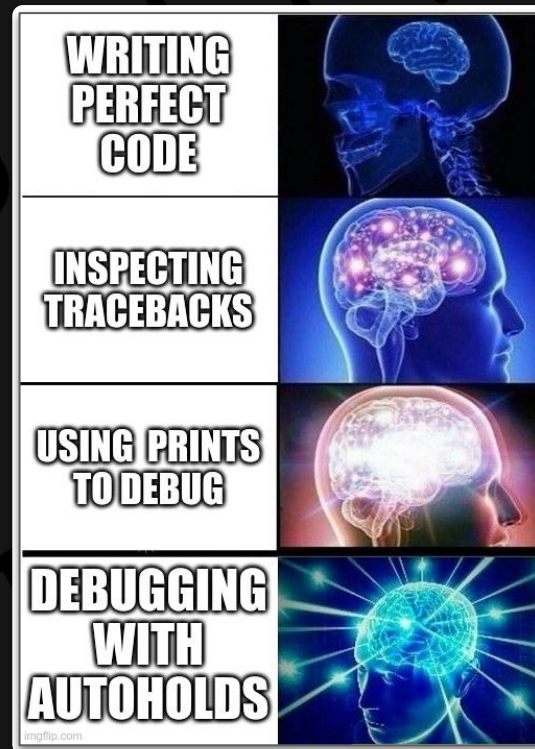
## >> Advantages, drawbacks and alternatives

- **Elegant** solution, offering access to the testing environment.
  - \* **Authentication** must be set for the node in advance.
- **Limitations:**
  - \* **Does not work** with **container**-based runners.
  - \* No way to **extend hold duration** for already held node.
- Common **alternative** approaches:
  - \* Adding **debug** tasks in jobs... – ineffective.
  - \* Utilizing **remote-pdb** tool... – timeout vulnerable.



## >> Summary and conclusions for takeaway

- **Zuul CI** – a project gating system.
- Usually a **node** lives only for the job duration.
- **Autoholds** mechanism offers a neat solution!
- It is now available conveniently in the **Web UI**!
- **Ask** your Zuul admins about the details!



**Dzięk!**  
**Gracias!**  
**Thanks!**



Grab the slides:

<https://datko.pl/os-vancouver.pdf>

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