



# The secret to happy queues

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Daniel Magliola

 @dmagliola

indeed flex™



RUBYCONF



@dmagliola

**MUNDER  
DIFFLING,  
PAPER COMPANY**



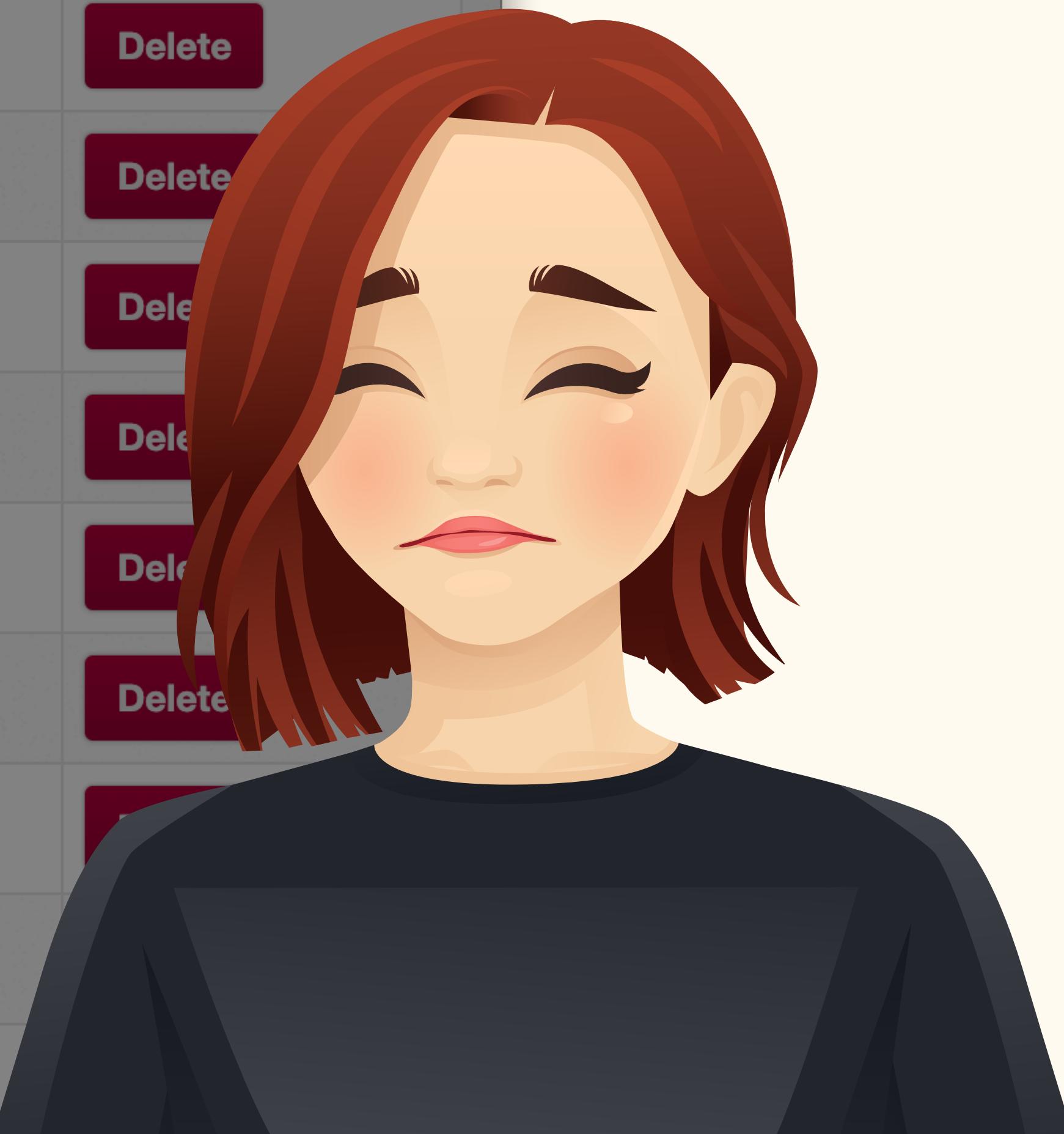


@dmagliola

2,156,912,523	0	24	142,594	0	0	0
Processed	Failed	Busy	Enqueued	Retries	Scheduled	Dead

## Queues

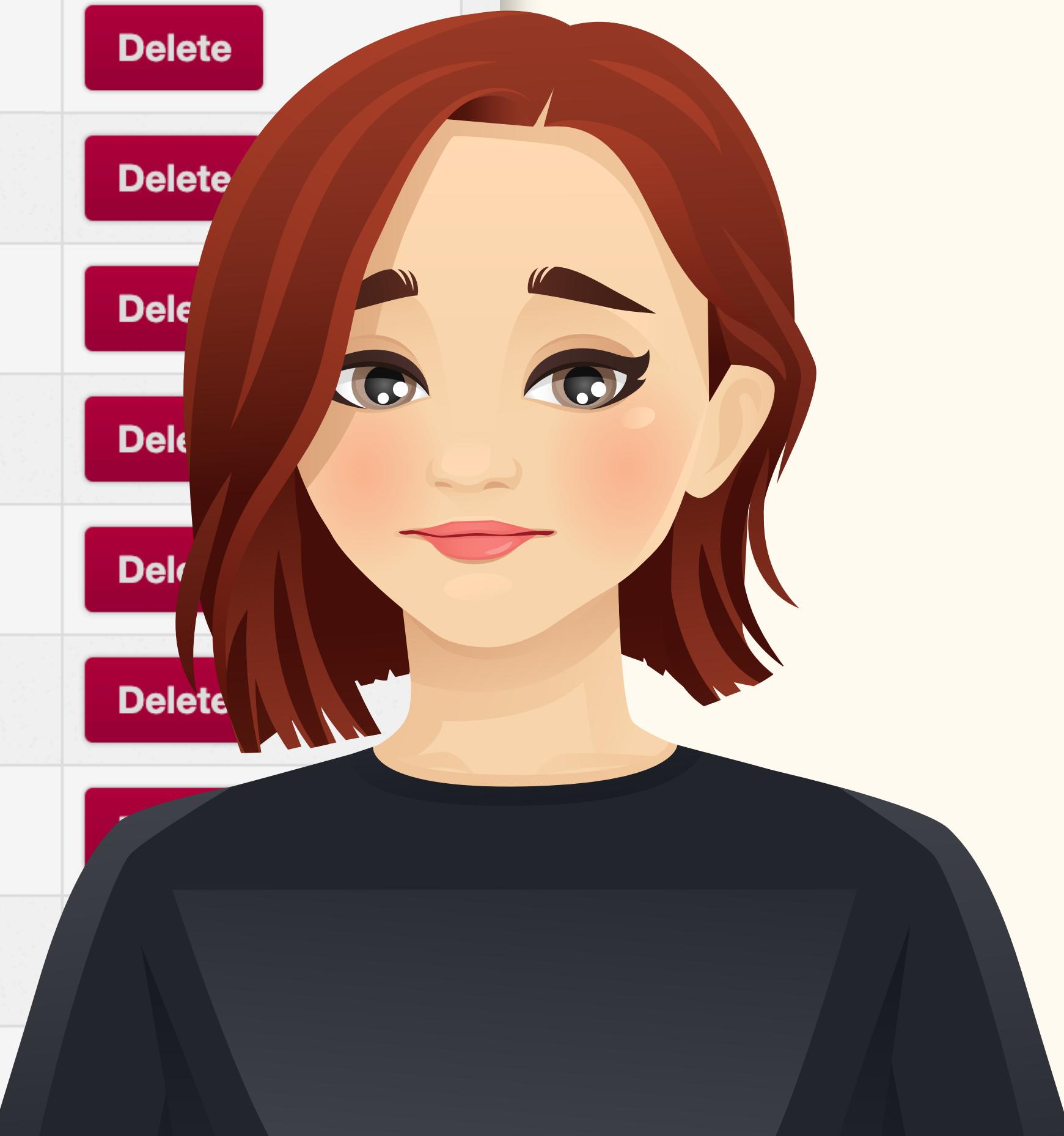
Queue	Size	Latency	Actions
critical	142,594	1,322.81 (22 minutes ago)	<button>Delete</button>
crm_sync	0	0	<button>Delete</button>
db_maintenance	0	0	<button>Delete</button>
default	0	0	<button>Delete</button>
event_source	0	0	<button>Delete</button>
high	0	0	<button>Delete</button>
low	0	0	<button>Delete</button>
mailers	0	0	
metrics	0	0	



2,157,055,117	0	0	0	0	0	0
Processed	Failed	Busy	Enqueued	Retries	Scheduled	Dead

## Queues

Queue	Size	Latency	Actions
critical	0	0	<button>Delete</button>
crm_sync	0	0	<button>Delete</button>
db_maintenance	0	0	<button>Delete</button>
default	0	0	<button>Delete</button>
event_source	0	0	<button>Delete</button>
high	0	0	<button>Delete</button>
low	0	0	<button>Delete</button>
mailers	0	0	
metrics	0	0	





A cartoon illustration of a woman with short brown hair and a wide-open mouth, appearing surprised or excited. A large, white, cloud-shaped thought bubble originates from her head, containing the text "Of course!" in a black, cursive font. To the right of the woman's head, a glowing yellow lightbulb with radiating lines is shown, symbolizing an idea or realization.

Of course!

Hi

**indeed flex**

A long time ago, in a company far,  
far away....



# default





ACT 1

# Paved with good intentions

## Reset Password functionality not working

To Do ▾

### Description

Multiple customers are complaining that the Reset Password functionality is broken, please fix.

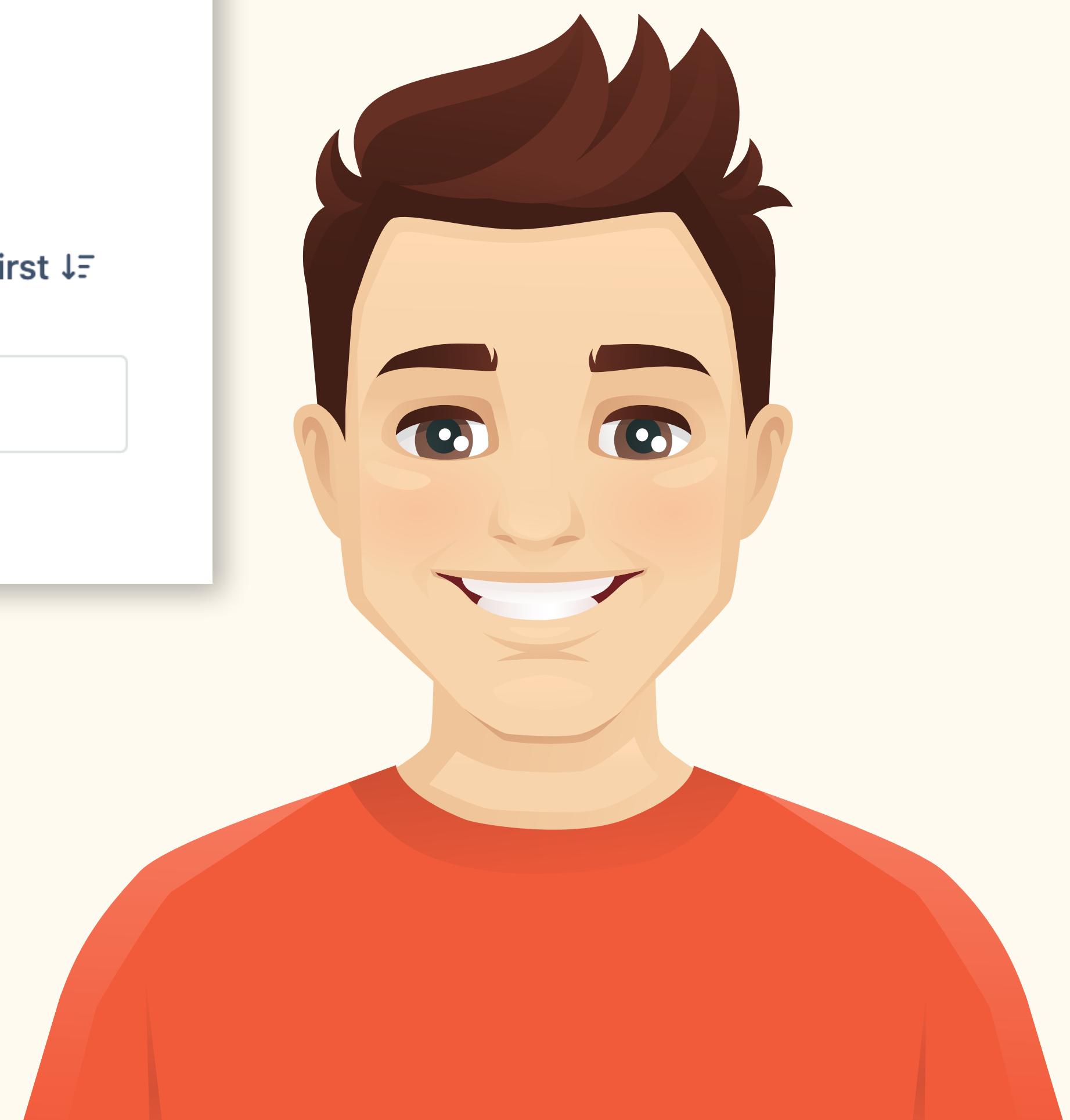
### Activity

Show: Comments ▾

Newest first ↓

Add a comment...

Pro tip: press **M** to comment



## Reset Password functionality not working

To Do ▾

### Description

Multiple customers are complaining that the Reset Password functionality is broken, please fix.

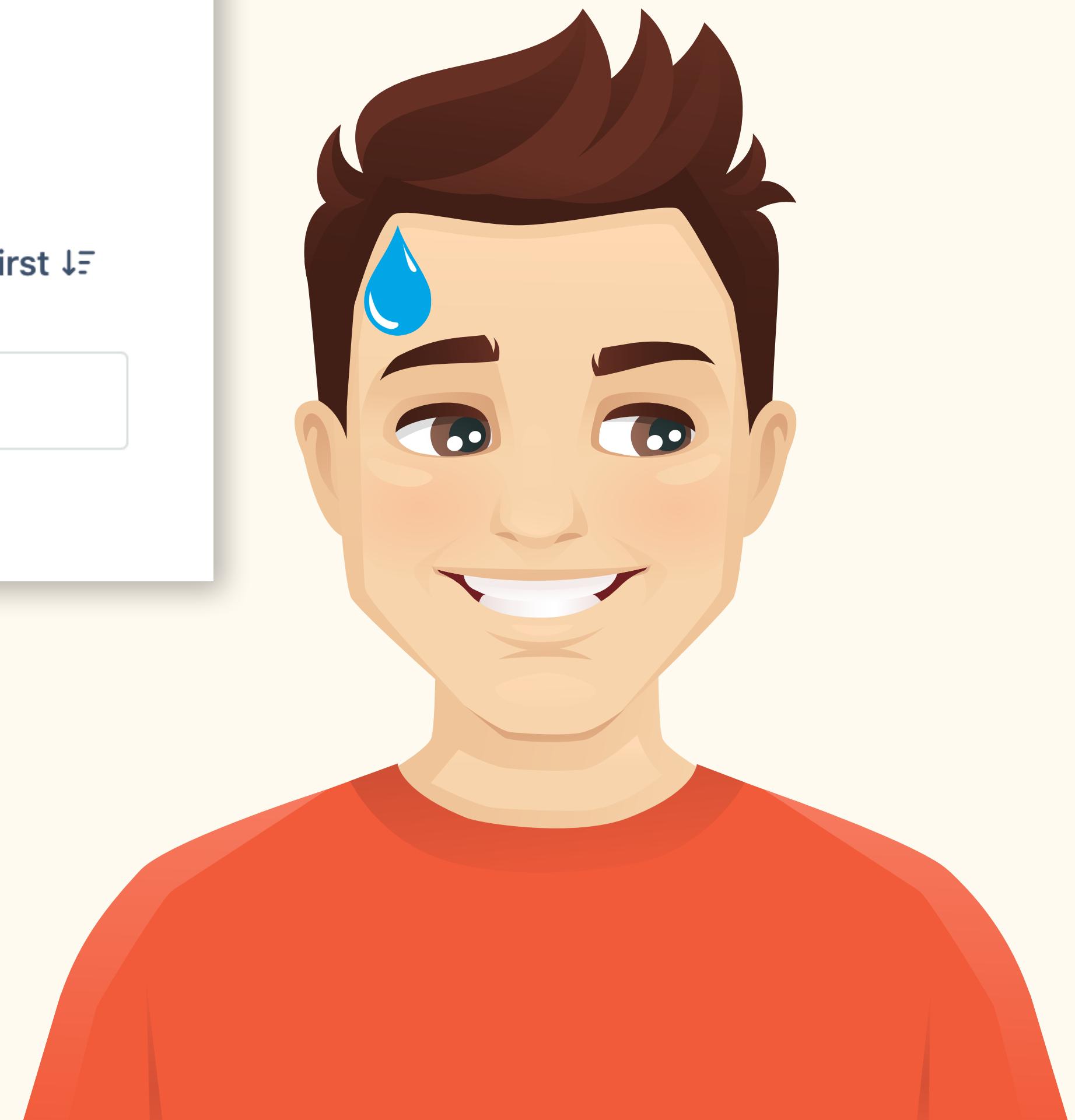
### Activity

Show: Comments ▾

Newest first ↓

Add a comment...

Pro tip: press **M** to comment



## Reset Password functionality not working

Done ▾

✓ Cannot Reproduce

### Description

Multiple customers are complaining that the Reset Password functionality is broken, please fix.

### Activity

Show: Comments ▾

Newest first ↓

Add a comment...

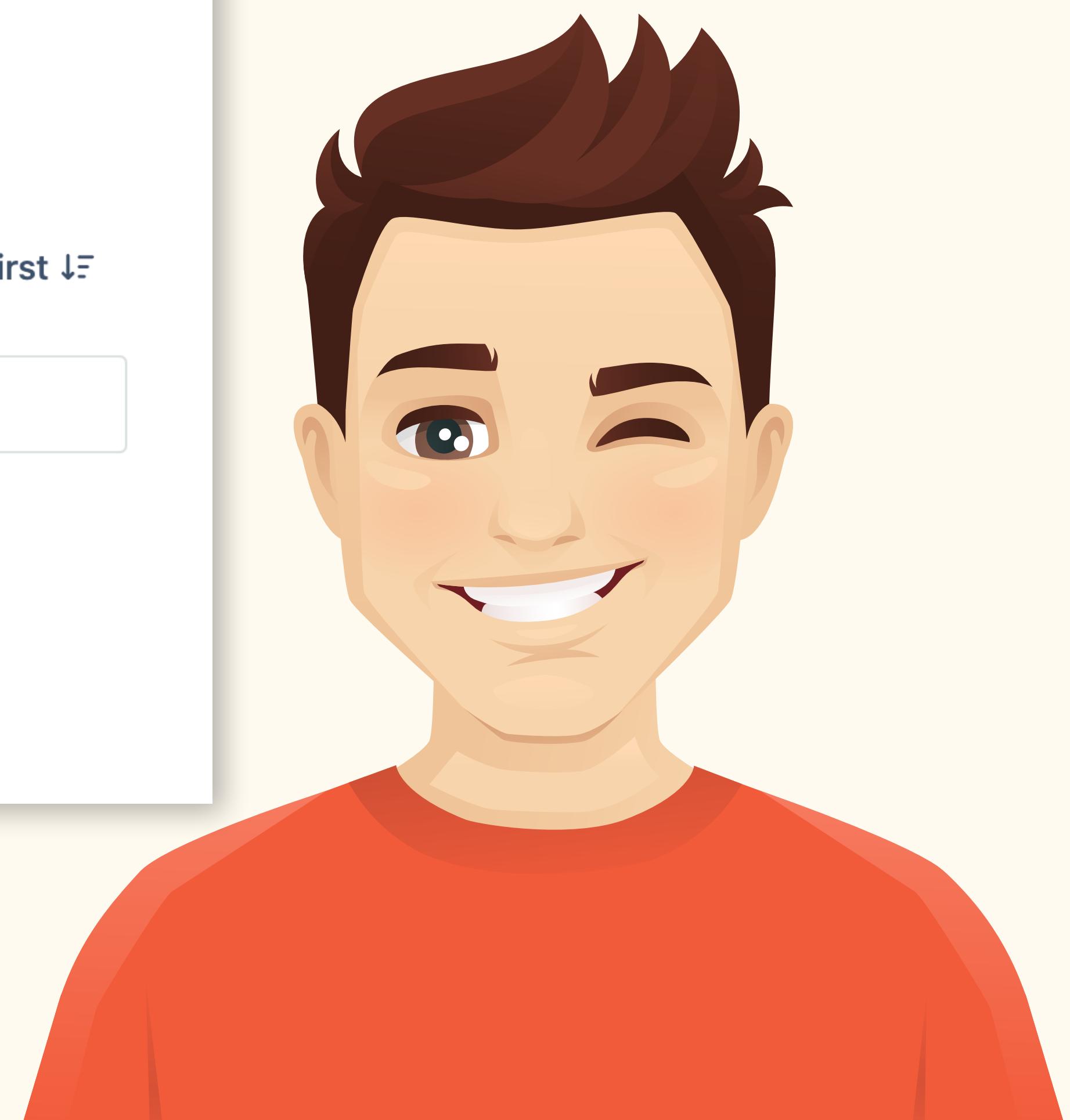
Pro tip: press **M** to comment



Joey 1 minute ago

Cannot reproduce the problem, it works in my dev laptop

Edit · Delete · 😊



@dmagliola

## Reset Password functionality not working

To Do ▾

### Description

Multiple customers are complaining that the Reset Password functionality is broken, please fix.

### Activity

Show: Comments ▾

Newest first ↓

Add a comment...

Pro tip: press **M** to comment



Customer Support 13 seconds ago

Customers continue to report they are not receiving the e-mail. Please investigate further

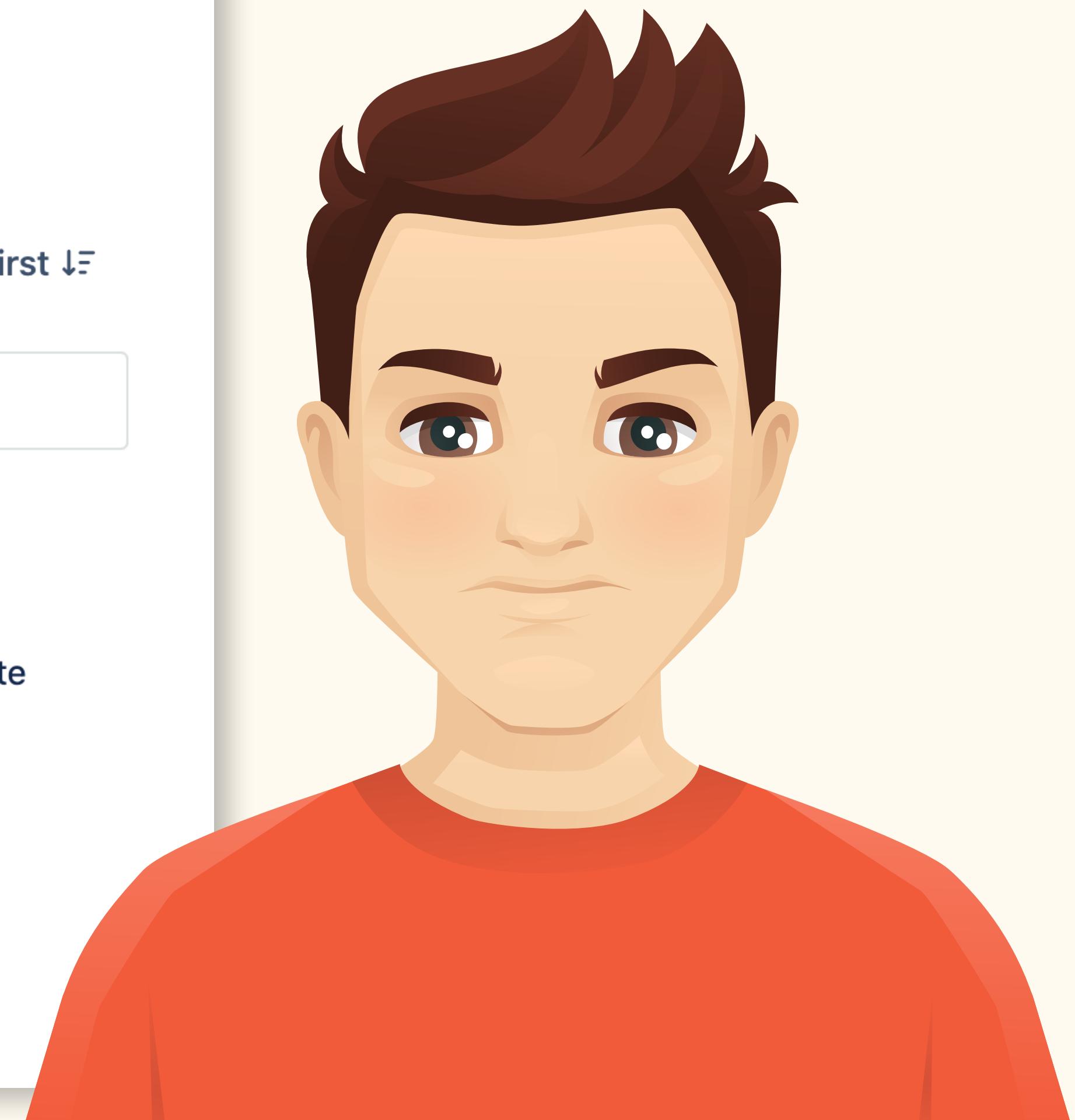
Edit · Delete · 😊



Joey 3 minutes ago

Cannot reproduce the problem, it works in my dev laptop

Edit · Delete · 😊



@dmagliola

1,314,923	0	10	43,130	0	0	0
Processed	Failed	Busy	Enqueued	Retries	Scheduled	Dead

## Queues

Queue	Size	Latency	Actions
default	43,130	1,071.69 (17 minutes ago)	<a href="#">Delete</a>



## Reset Password functionality not working

Done ▾

✓ Done

### Description

Multiple customers are complaining that the Reset Password functionality is broken, please fix.

### Activity

Show: Comments ▾

Newest first ↓

Add a comment...

Pro tip: press **M** to comment



Joey 16 seconds ago

Turns out, our queues were having trouble.

Drained the queues, and now the issue should be resolved.

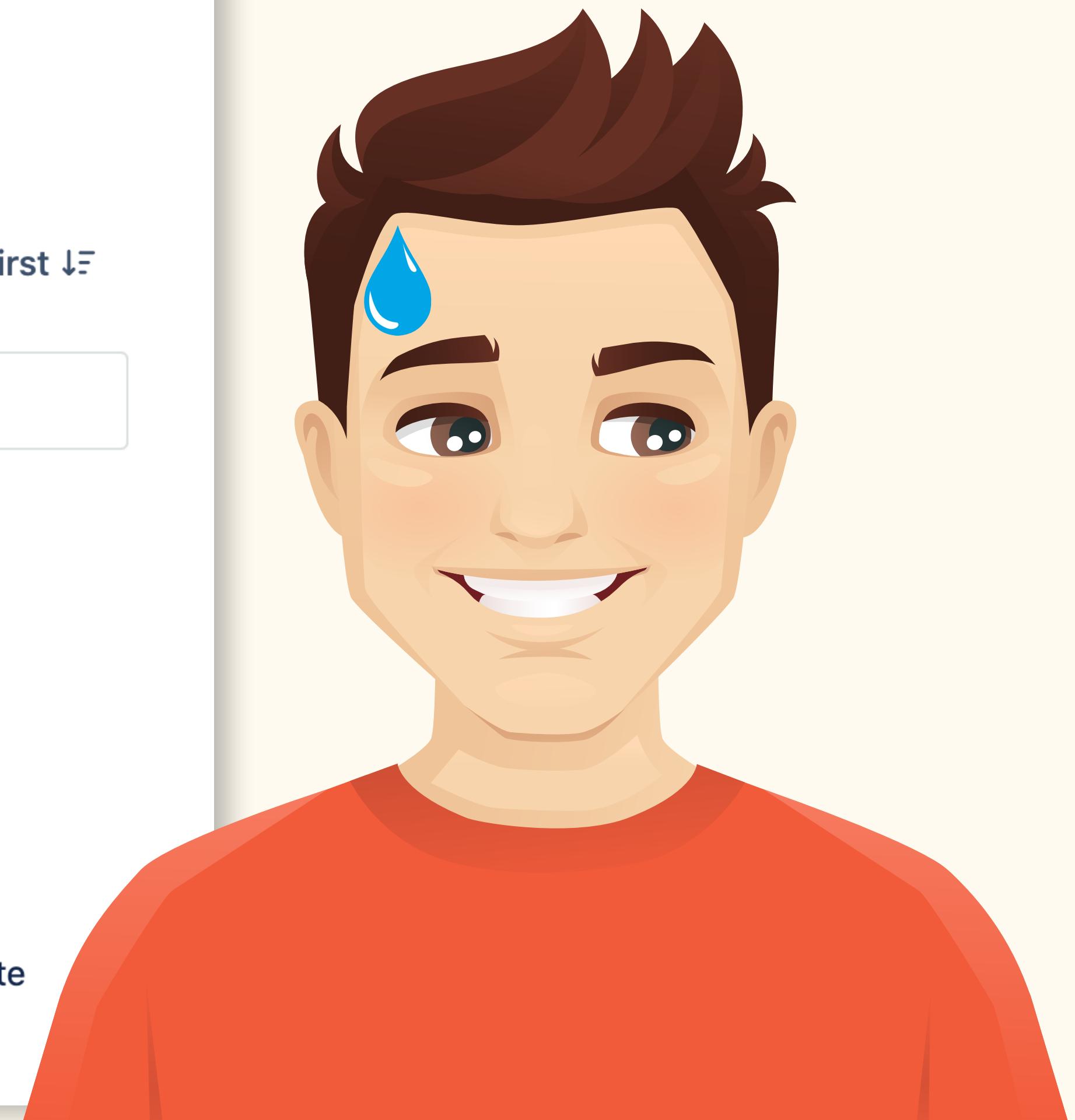
Edit · Delete · ☺



Customer Support 2 minutes ago

Customers continue to report they are not receiving the e-mail. Please investigate further

Edit · Delete · ☺



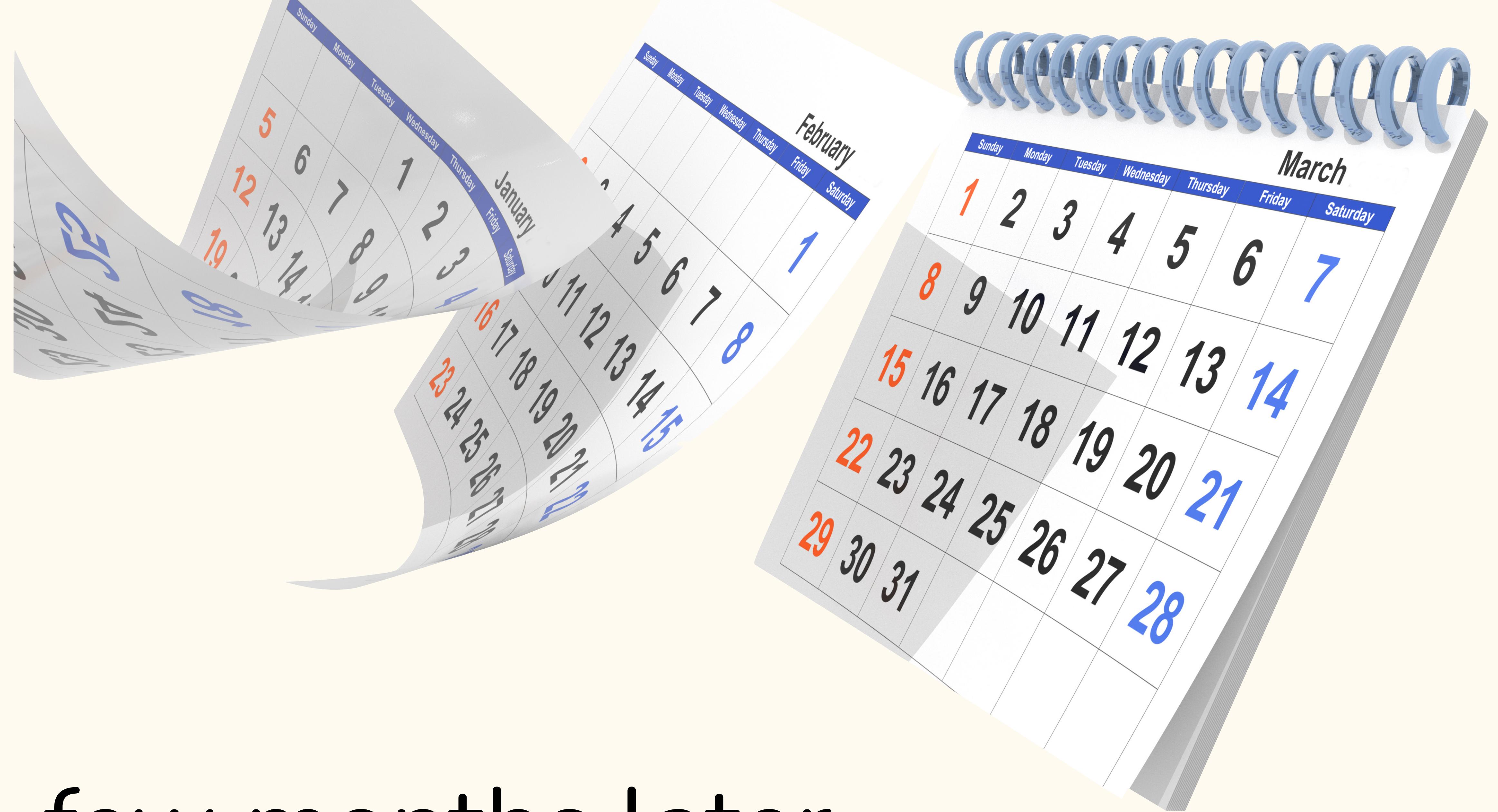
@dmagliola

1,592,518	0	0	0	0	0	0
Processed	Failed	Busy	Enqueued	Retries	Scheduled	Dead

## Queues

Queue	Size	Latency	Actions
default	0	0	<button>Delete</button>
high	0	0	<button>Delete</button>
low	0	0	<button>Delete</button>



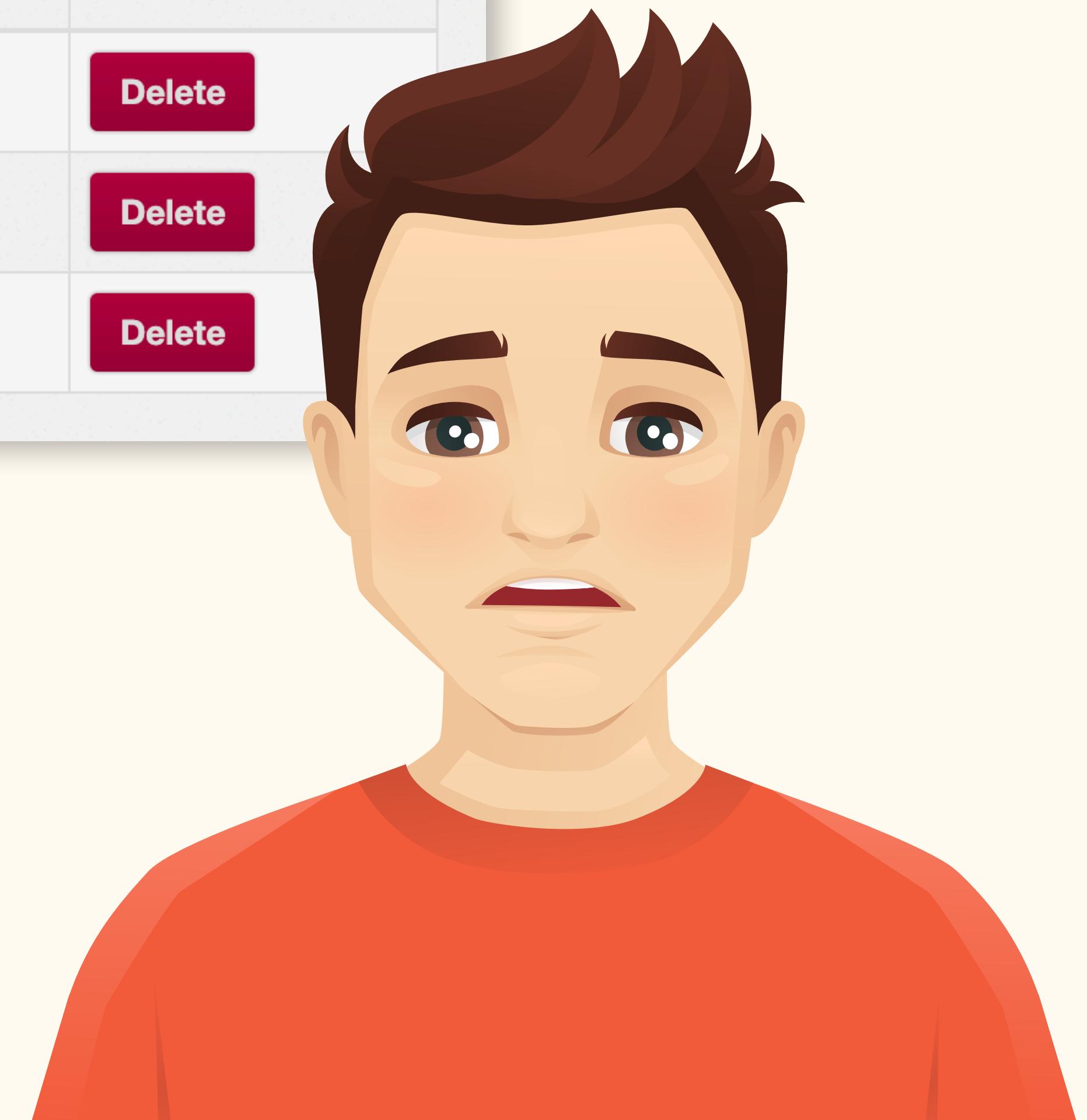


A few months later...

1,812,534	0	10	25,512	0	0	0
Processed	Failed	Busy	Enqueued	Retries	Scheduled	Dead

## Queues

Queue	Size	Latency	Actions
default	0	0	<button>Delete</button>
high	25,512	2,101.35 (35 minutes ago)	<button>Delete</button>
low	0	0	<button>Delete</button>



critical

# critical





ACT 2

It happened again

<b>4,856,782</b>	<b>0</b>	<b>10</b>	<b>9,155</b>	<b>0</b>	<b>0</b>	<b>0</b>
Processed	Failed	Busy	Enqueued	Retries	Scheduled	Dead

## Queues

Queue	Size	Latency	Actions
critical	9,155	2,409.98 (40 minutes ago)	<a href="#">Delete</a>
default	0	0	<a href="#">Delete</a>
high	0	0	<a href="#">Delete</a>
low	0	0	<a href="#">Delete</a>

4,856,782	0	10	9,155	0	0	0
Processed	Failed	Busy	Enqueued	Retries	Scheduled	Dead

## Queues

Queue	Size	Latency	Actions
critical	9,155	2,409.98 (40 minutes ago)	<button>Delete</button>
default	0	0	<button>Delete</button>
high	0	0	<button>Delete</button>
low	0	0	<button>Delete</button>



4,856,782

Processed

0

Failed

10

Busy

9,155

Enqueued

0

Retries

0

Scheduled

0

Dead

## Queues

Queue	Size	Latency
critical	9,155	2,409.9
default	0	0
high	0	0
low	0	0

Purpose!  
Not Priority!

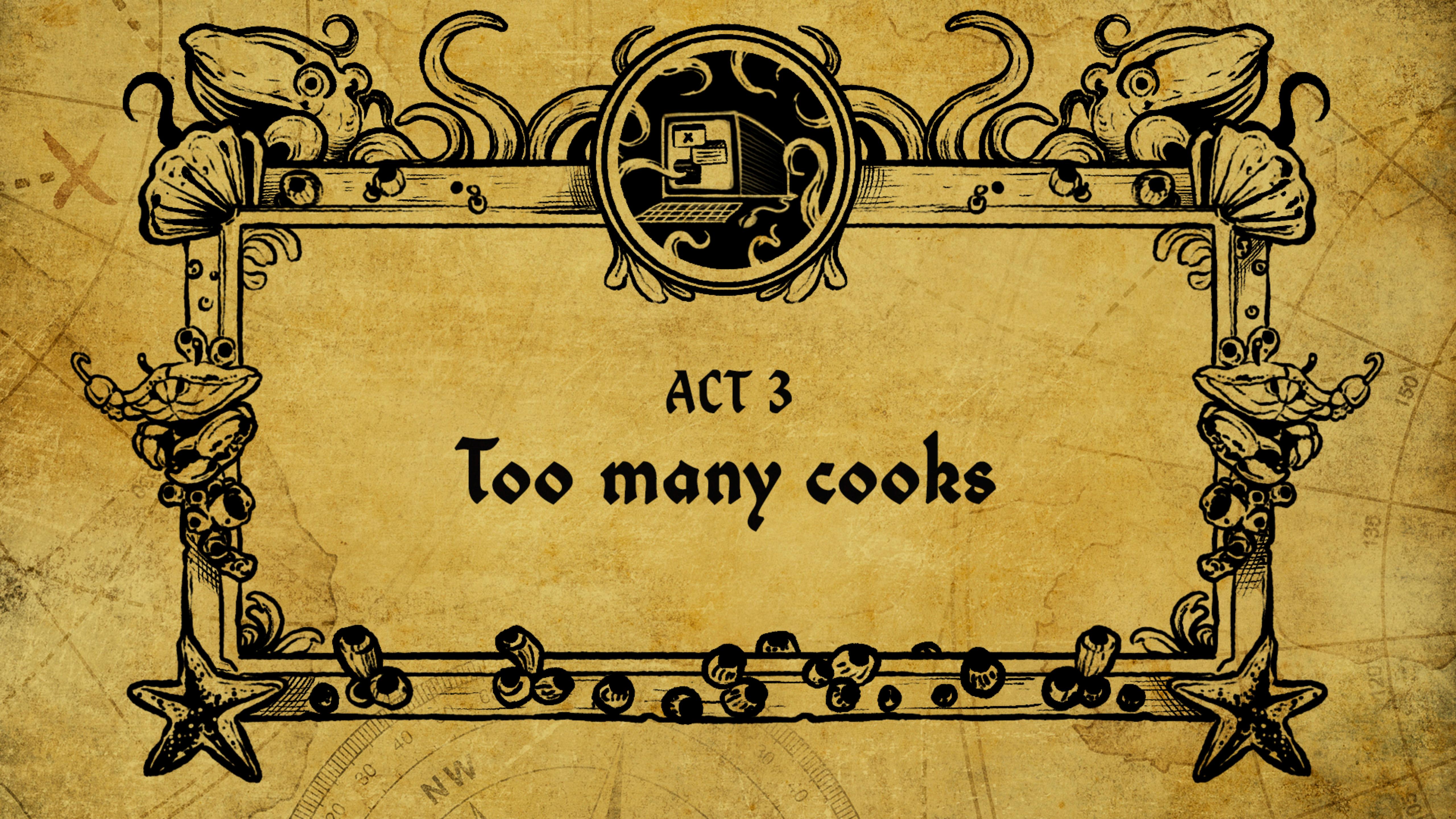


7,562,253	0	0	0	0	0	0
Processed	Failed	Busy	Enqueued	Retries	Scheduled	Dead

## Queues

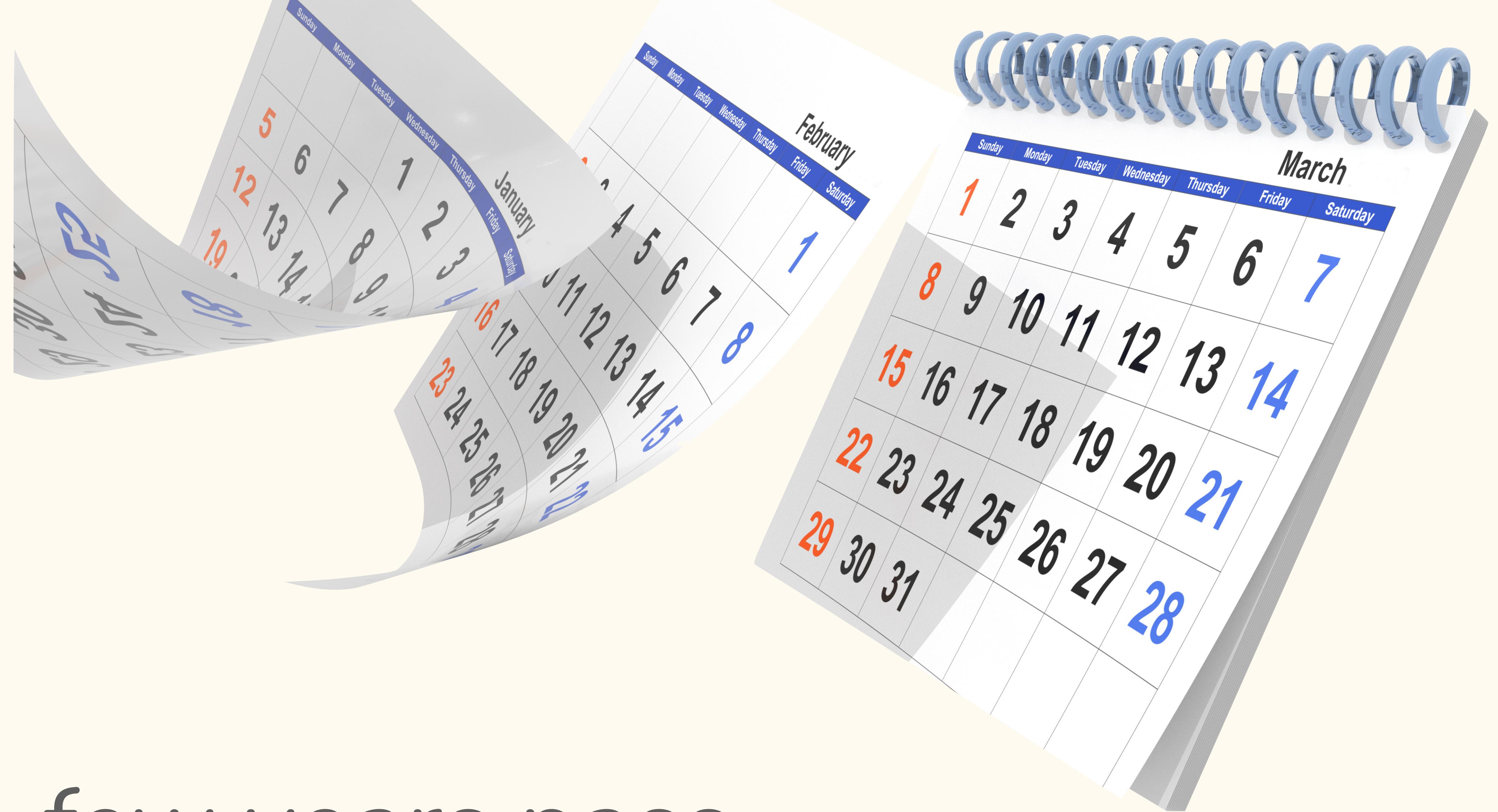
Queue	Size	Latency	Actions
critical	0	0	<button>Delete</button>
crm_sync	0	0	<button>Delete</button>
db_maintenance	0	0	<button>Delete</button>
default	0	0	<button>Delete</button>
high	0	0	<button>Delete</button>
low	0	0	<button>Delete</button>
mailers	0	0	<button>Delete</button>
surveys	0	0	<button>Delete</button>
webhooks	0	0	<button>Delete</button>





ACT 3

Too many cooks



A few years pass...

## Mad

Things that frustrated you in the last i... ↗

- ⋮ Other teams' jobs screwed us over again :(

We missed delivery deadlines  
⋮ again with the queuepocalypse 🤦. We're going to have some angry customer calls...

The Purchasing folks broke our queues for the 4th time this month!!! 🤦

⋮ Our queues got f@#\$%& again 😭

We have to have a chat with Purchasing, our queues keep getting screwed up

We need to figure out how to make our queues saner. We can't keep doing this.

## Sad

Things that disappointed you in the l... ↗

- ⋮ We spent so much time sorting our queues, we're way behind on our plans

## Glad

Things that excited you in the last iter... ↗

- ⋮ Kudos to Sally fixing our queues!



## Mad

Things that frustrated you in the last i... ↗

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We missed delivery deadlines  
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The Purchasing fell down  
⋮ queues for the month!!! 🤦

⋮ Our queues

to h  
ng  
crevved up

to figure out how to  
our queues saner. We can't  
doing this.

## Sad

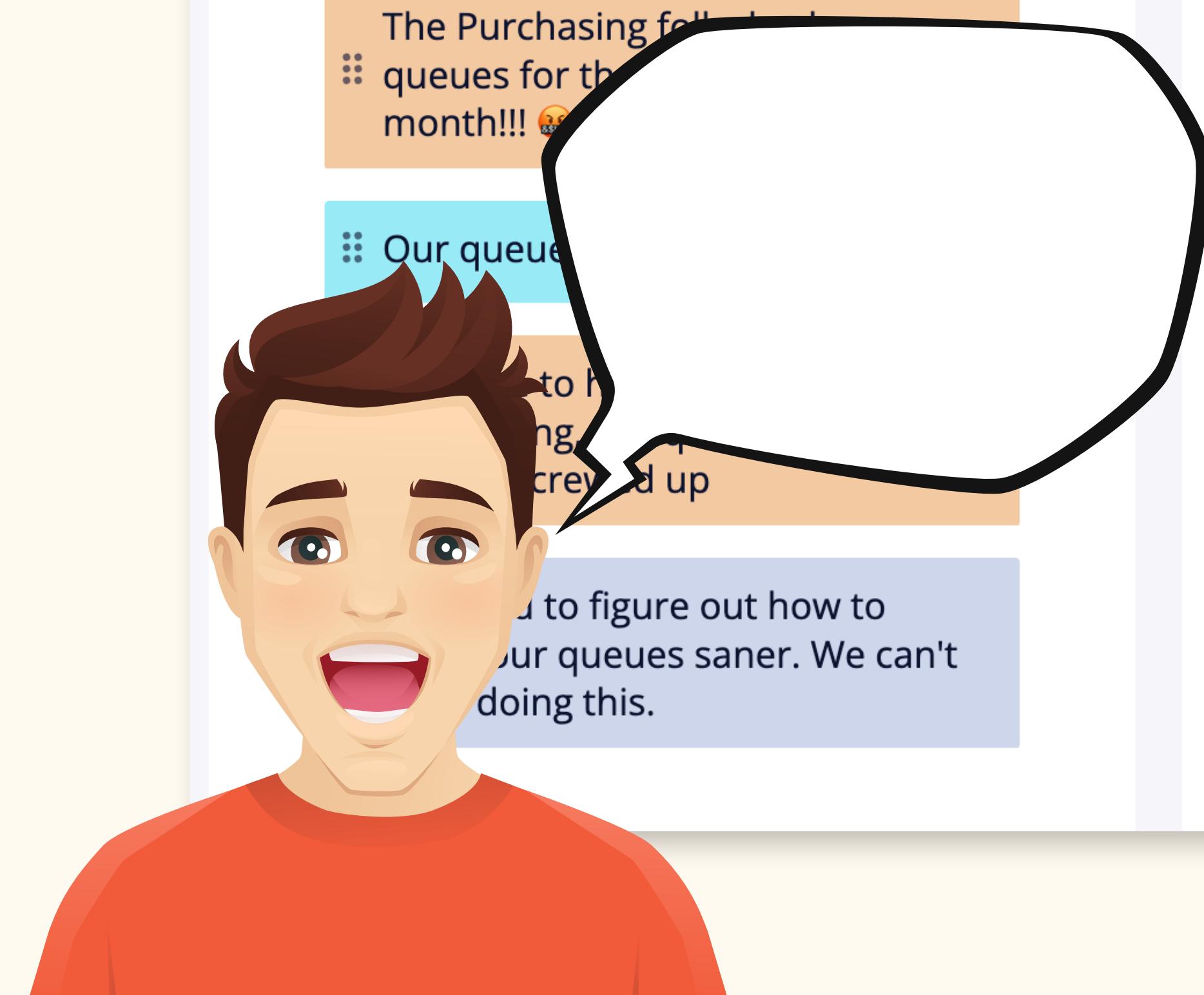
Things that disappointed you in the l... ↗

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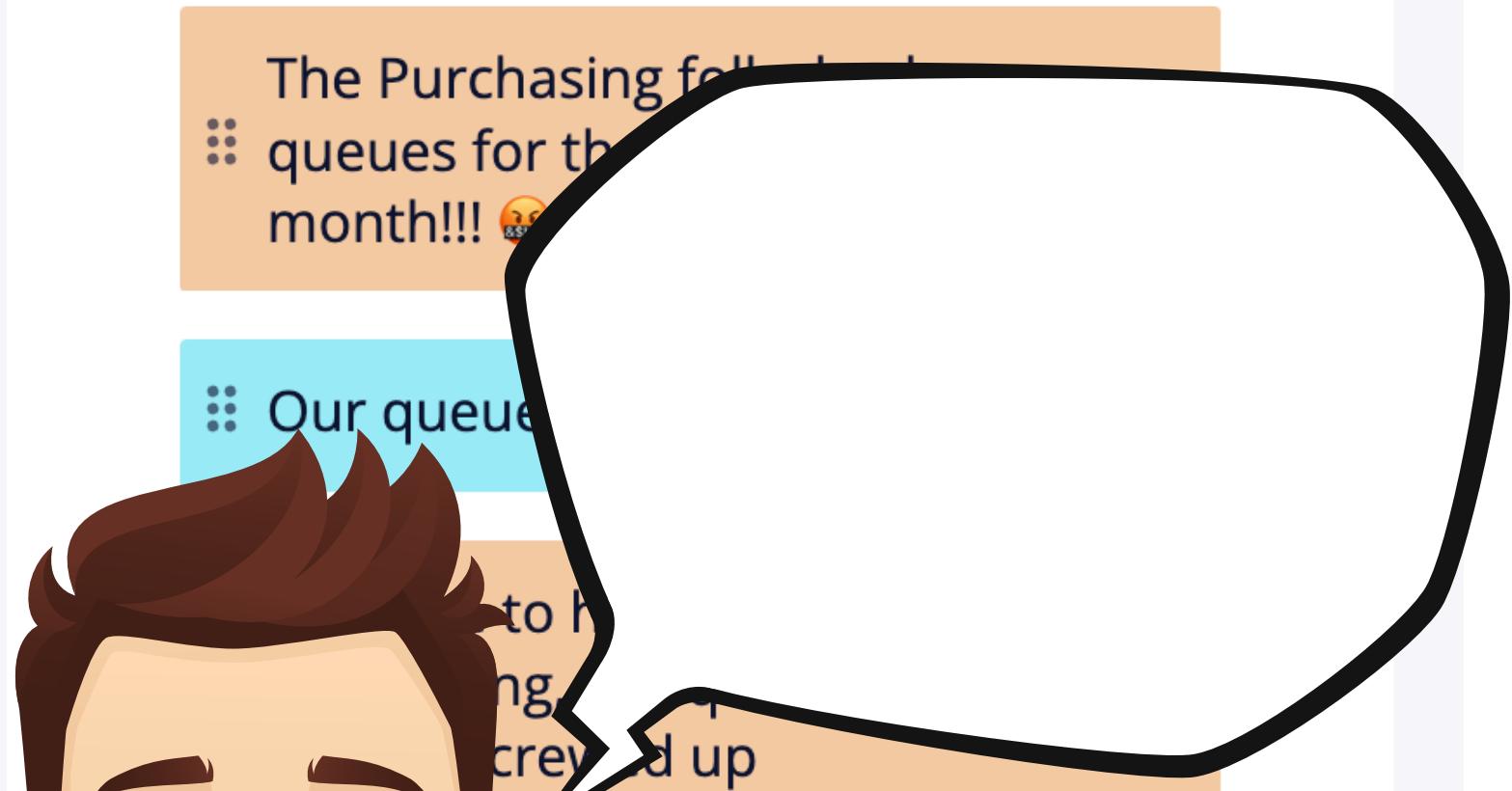


## Mad

Things that frustrated you in the last i... ↗

- Other teams' jobs screwed us over again :(

We missed delivery deadlines again with the queuepocalypse 😞. We're going to have some angry customer calls...



The Purchasing folks have created huge queues for the month!!! 🤬

- Our queues are getting bigger and bigger!

It's time to figure out how to make our queues saner. We can't keep doing this.

## Sad

Things that disappointed you in the l... ↗

- We spent so much time sorting our queues, we're way behind on our plans



Things that excited you in the last iter... ↗

- Kudos to Sally fixing our queues! 🙌

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- The Purchasing folks have created queues for the month!!! 🤦

- Our queues are getting bigger and bigger!

to help us figure out how to screw up

to figure out how to our queues saner. We can't doing this.

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you in the l... ↗

porting action

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We missed delivery deadlines again with the queuepocalypse 😞. We're going to have some angry customer calls...

The Purchasing folks broke our queues for the 4th time this month!!! 🤦‍♂️

Our queues got f@#\$%& again 😢

We have to have a chat with Purchasing, our queues keep getting screwed up

We need to figure out how to make our queues saner. We can't keep doing this.

## Sad

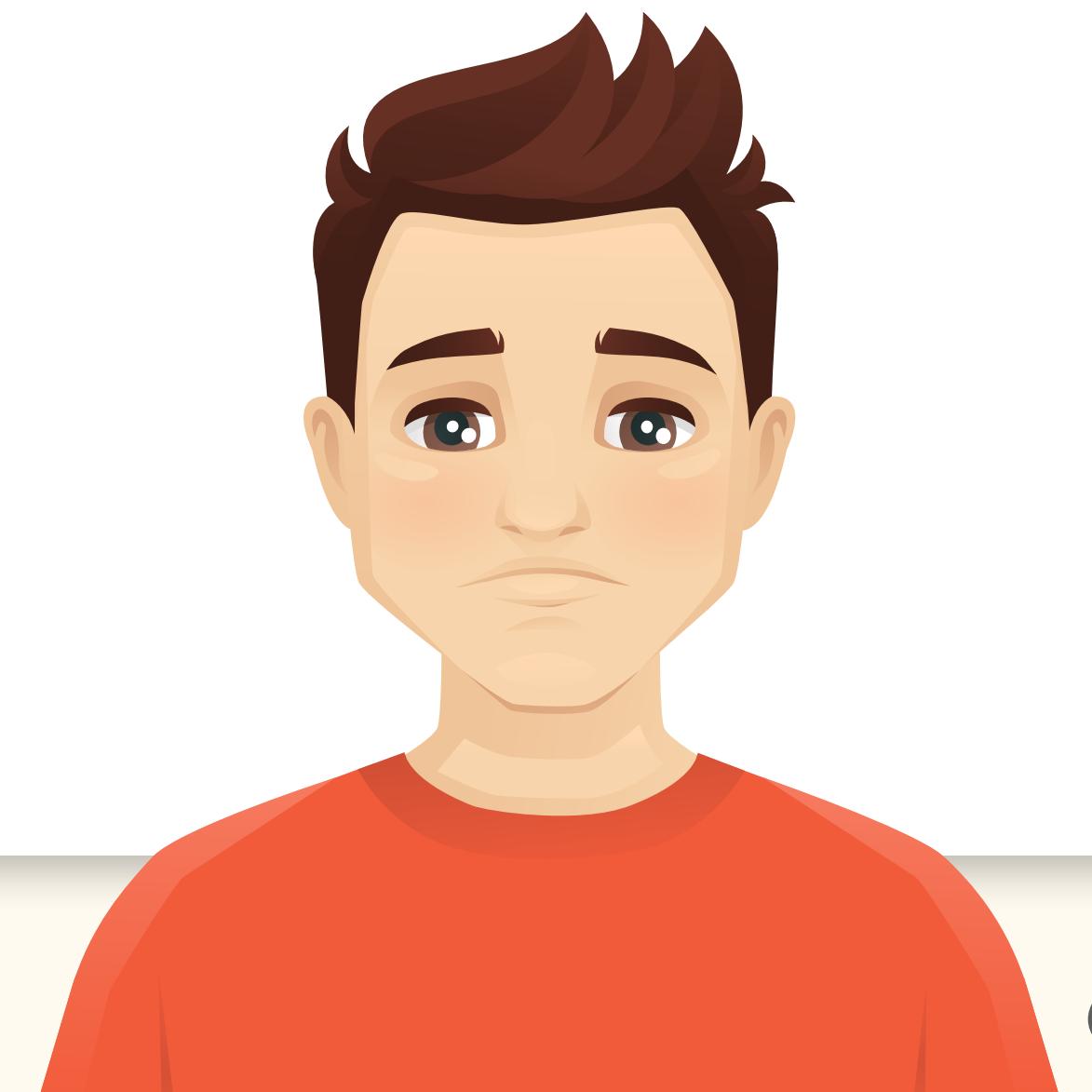
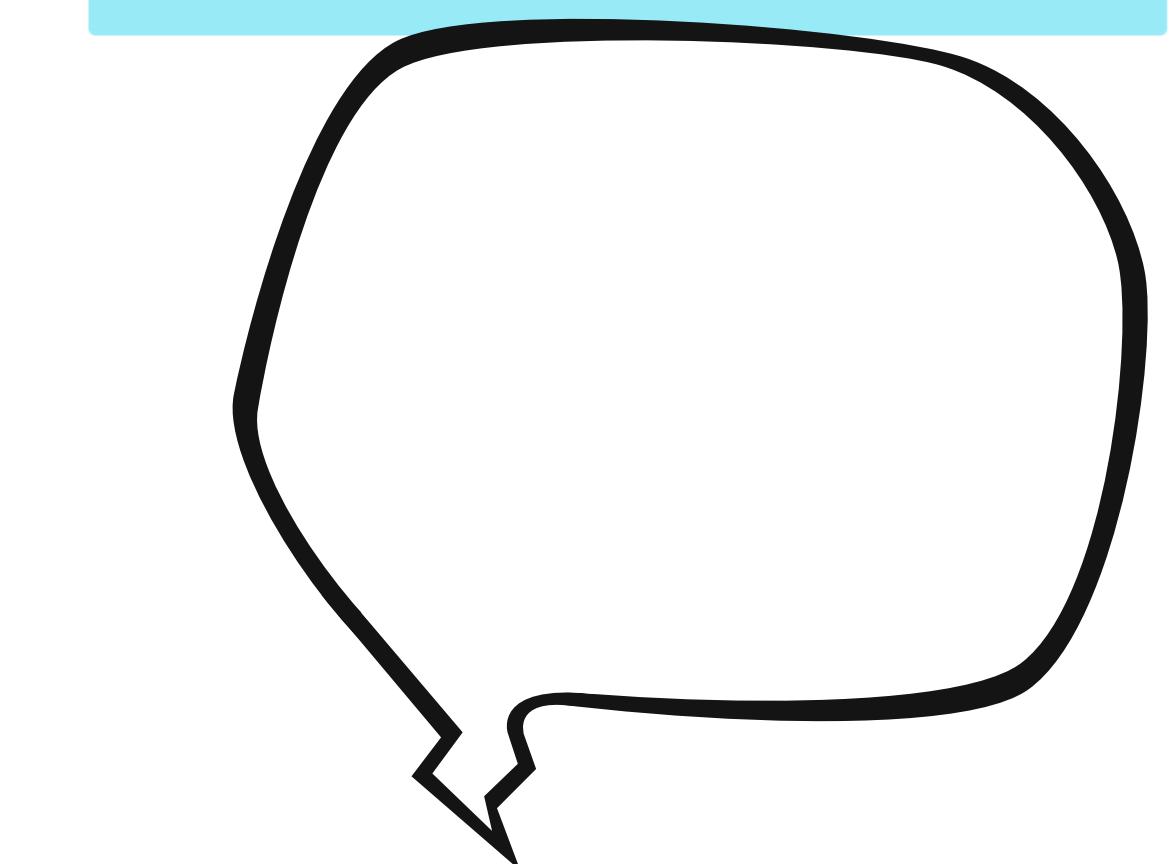
Things that disappointed you in the l... ↗

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- Other teams' jobs screwed us over again :(

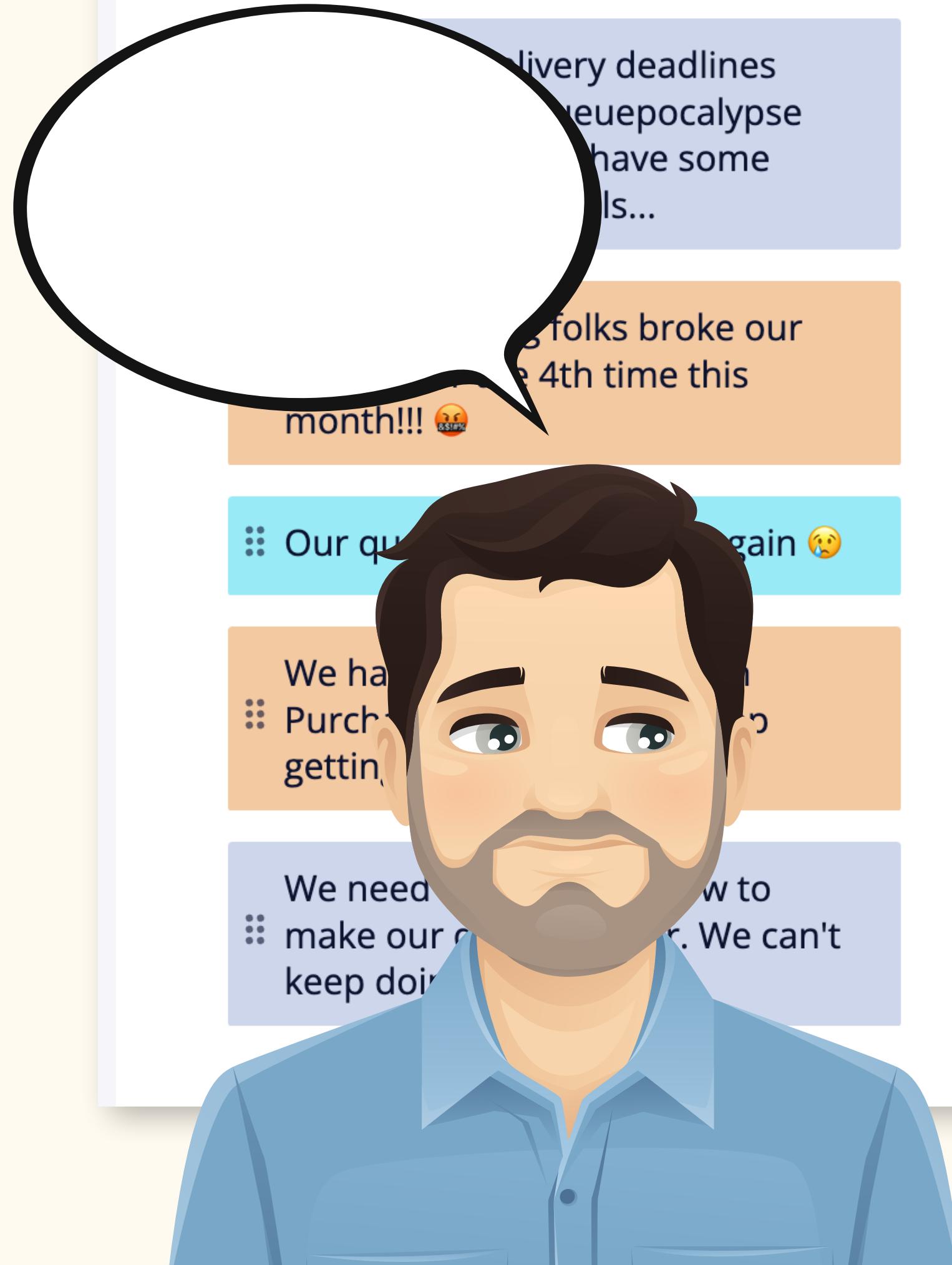
Delivery deadlines queue apocalypse have some balls...

Some folks broke our queue 4th time this month!!! 🚨

- Our queues are again 😢

- We have a lot of work to do
- Purchasing team is getting slower

- We need to learn how to make our code faster. We can't keep doing what we're doing.



## Sad

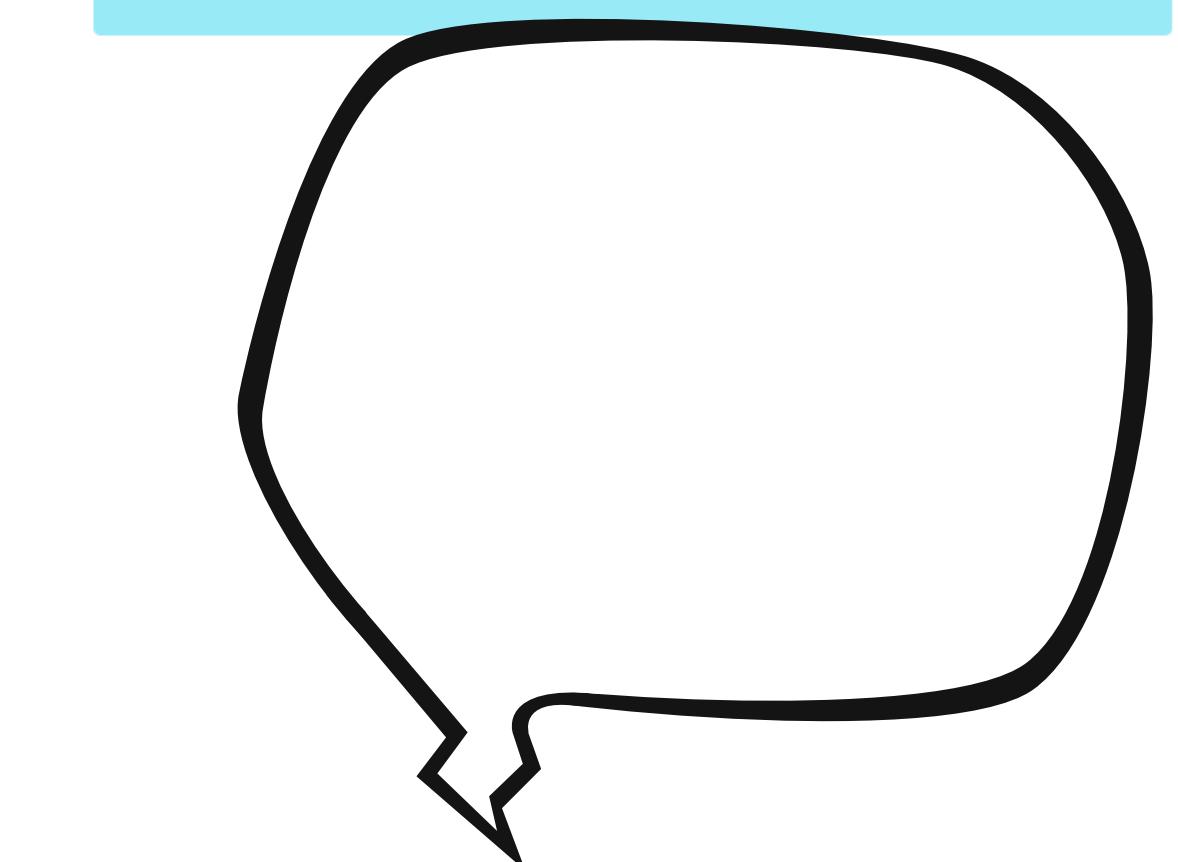
Things that disappointed you in the l... ↗

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## Glad

Things that excited you in the last iter... ↗

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## Mad

Things that frustrated you in the last i... ↗

- Other teams' jobs screwed us over again :(



- Our queue is down again 😢

- We have some problems
- Purchases are getting stuck

- We need to figure out how to make our code faster. We can't keep doing this.

## Sad

Things that disappointed you in the l... ↗

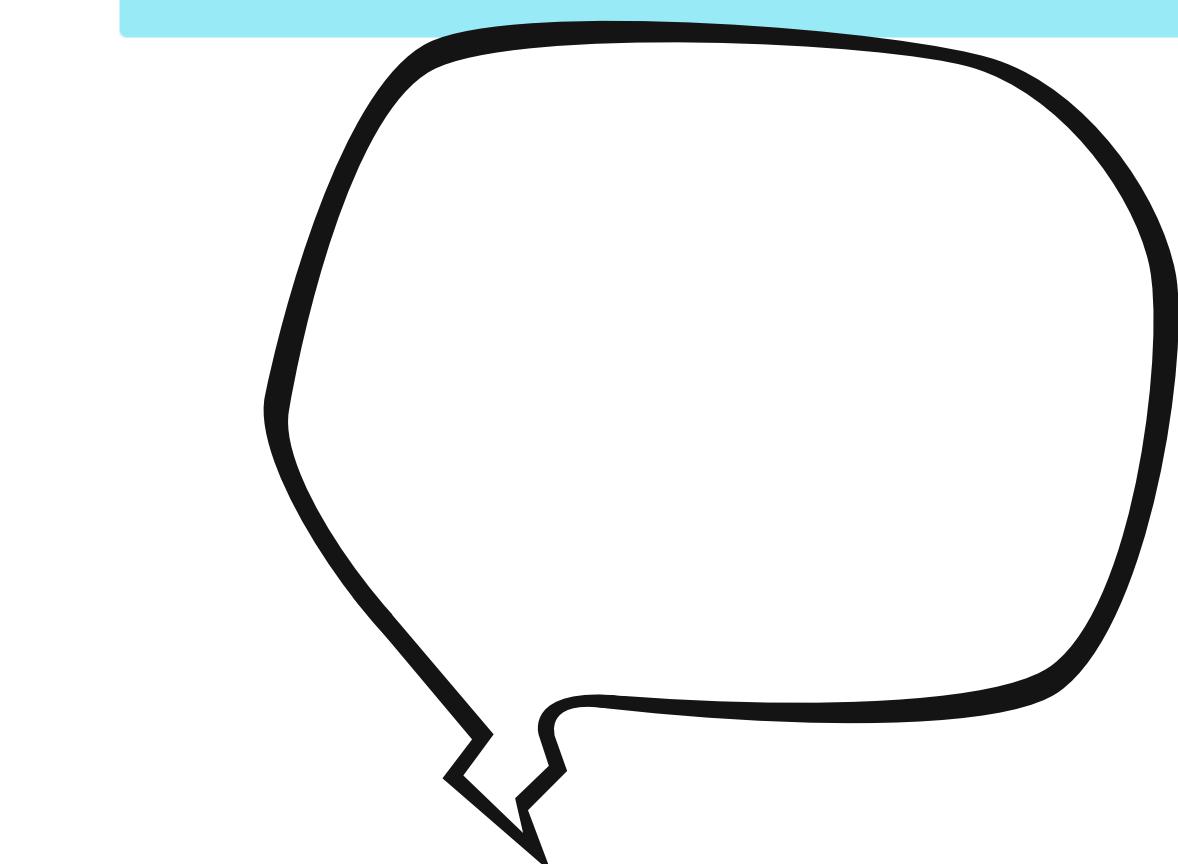
- We spent so much time sorting our queues, we're way behind on tasks



## Glad

Things that excited you in the last iter... ↗

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## Mad

Things that frustrated you in the last i... ↗

- Other teams' jobs screwed us over again :(

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Things that disappointed you in the l... ↗

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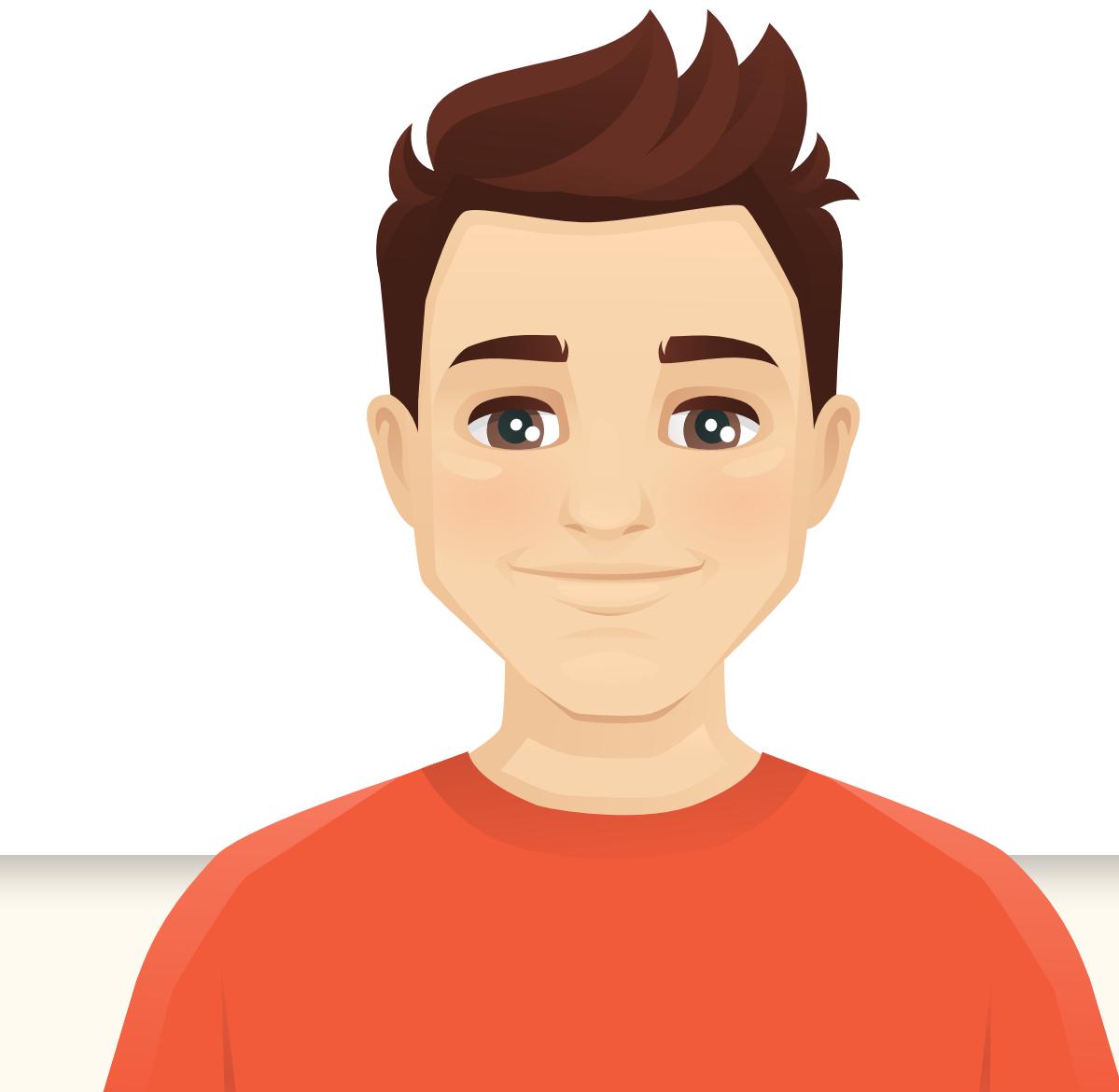
*There's only one way to fix this!*

- The Purchasing folks broke our queues for the 4th time this month!!! 🤬

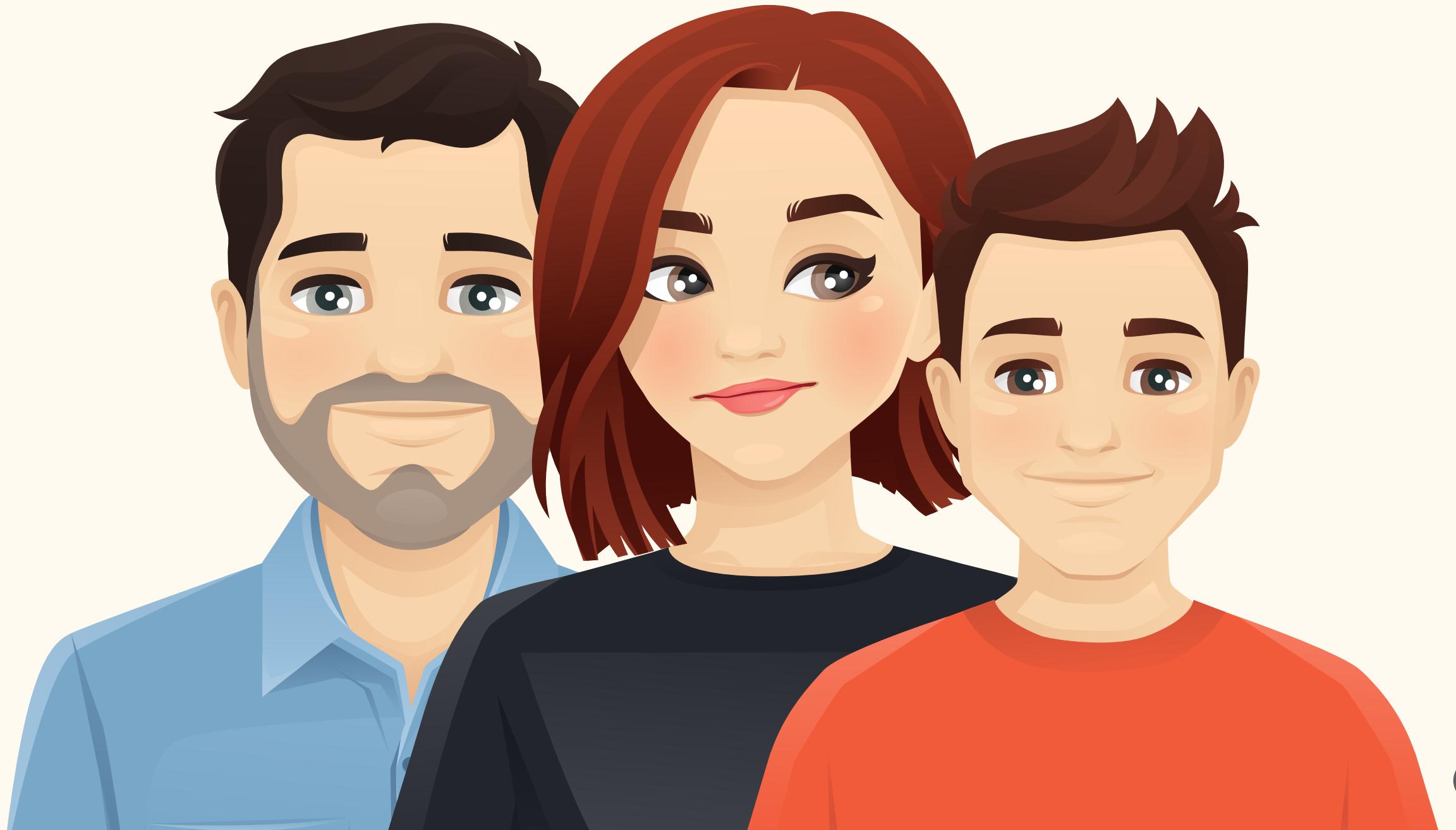
- Our queues are again 😢

- We have a problem with Purchasing again
- Purchasing is getting us into trouble

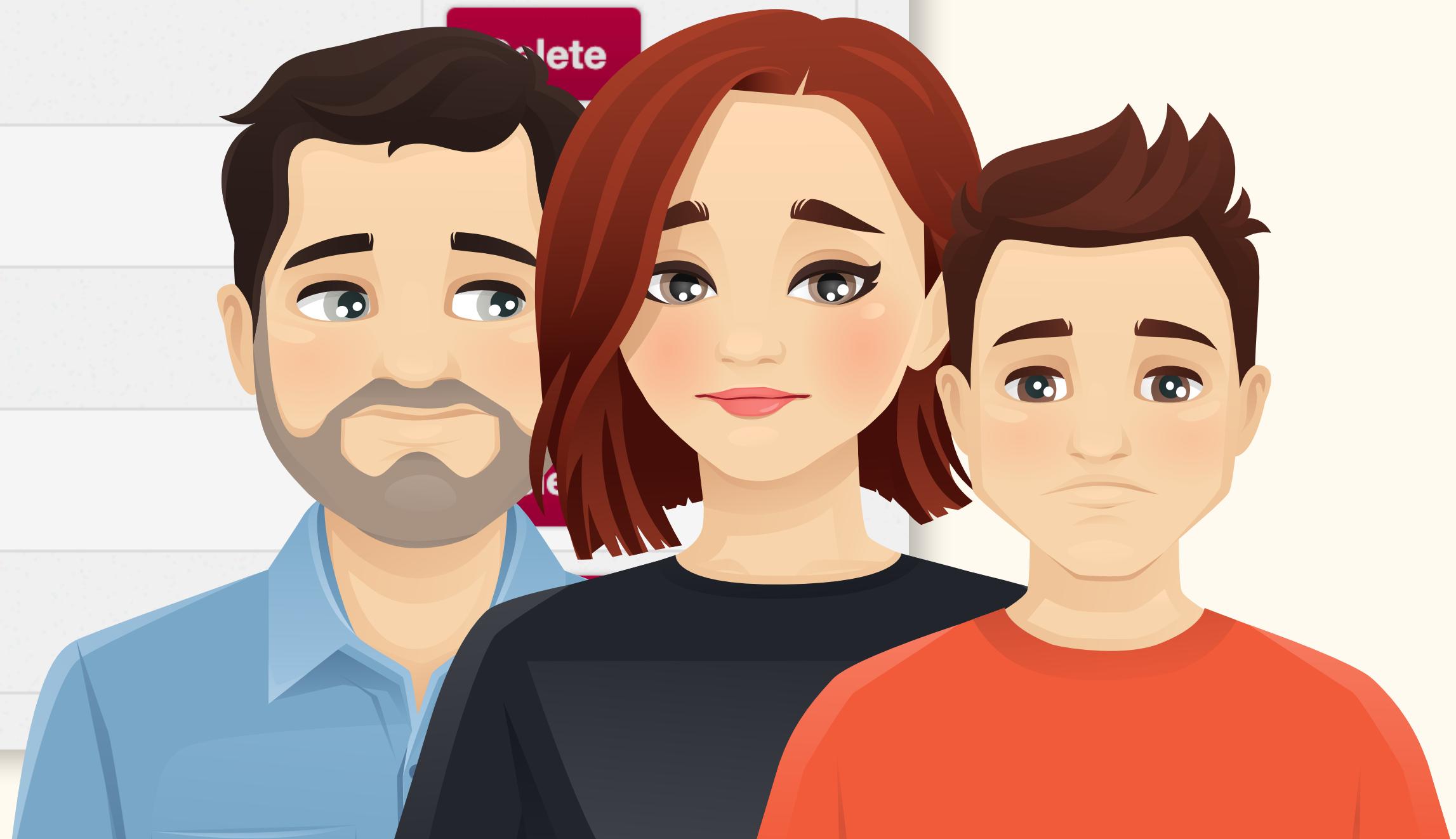
- We need to figure out how to make our queues better
- make our customers happy
- We can't keep doing this



# logistics\_team



Queue	Size	Latency	Actions
critical	0	0	<button>Delete</button>
default	0	0	<button>Delete</button>
high	0	0	<button>Delete</button>
inventory_team	0	0	<button>Delete</button>
logistics_team	0	0	<button>Delete</button>
low	0	0	<button>Delete</button>
notifications_team	0	0	<button>Delete</button>
purchasing_team	0	0	<button>Delete</button>
sales_team	0	0	<button>Delete</button>
warehouse_team	0	0	<button>Delete</button>



critical

crm\_sync

db\_maintenance

default

event\_source

high

inventory\_team

inventory\_team\_critical

inventory\_team\_high

inventory\_team\_low

logistics\_team

logistics\_team\_critical

logistics\_team\_high

low

mailers

metrics

notifications

notifications\_team

notifications\_team\_high

notifications\_team\_low

order\_lifecycle

pricing

purchasing\_team

purchasing\_team\_critical

purchasing\_team\_high

purchasing\_team\_low

sales

sales

sales

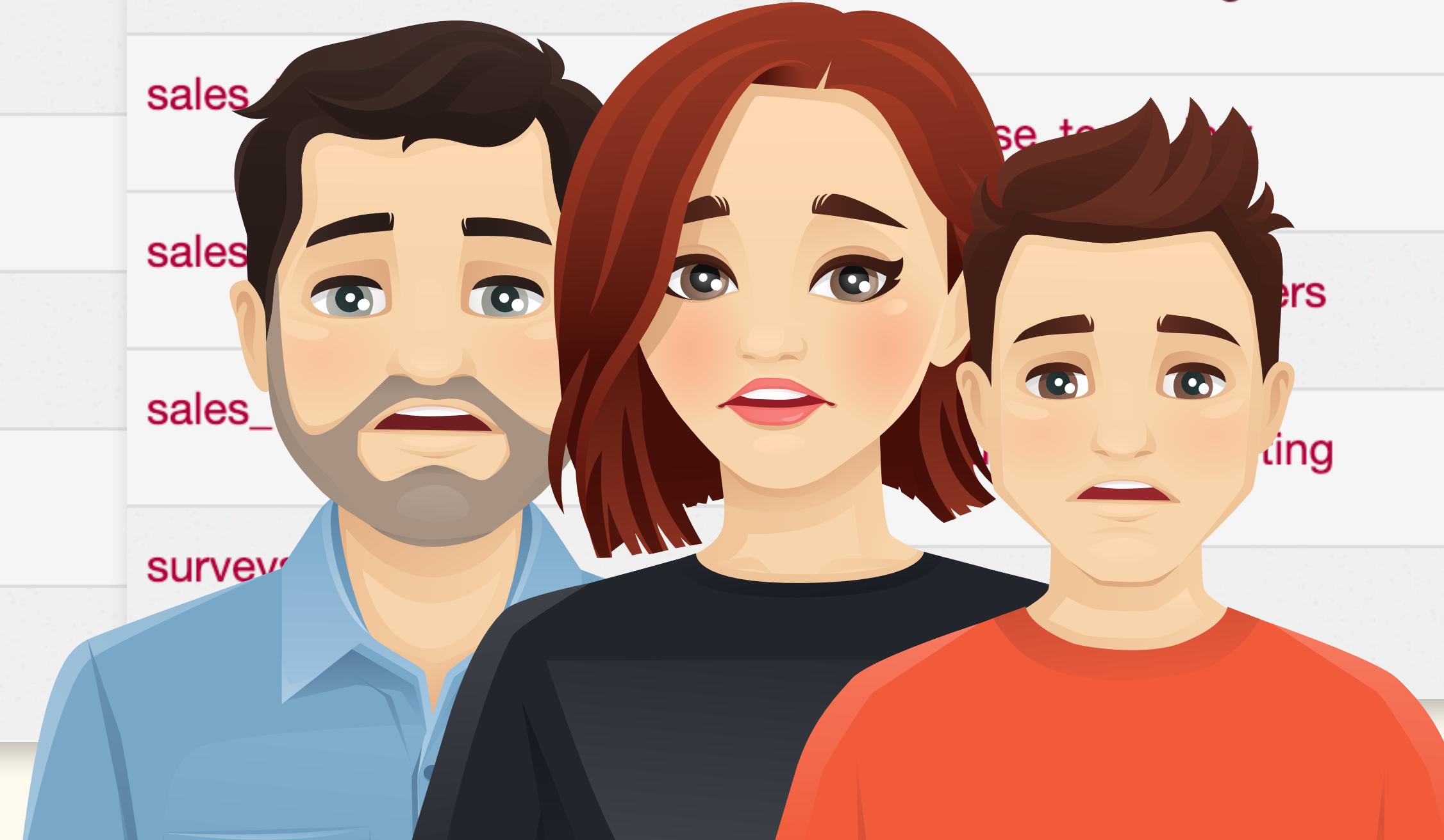
surveys

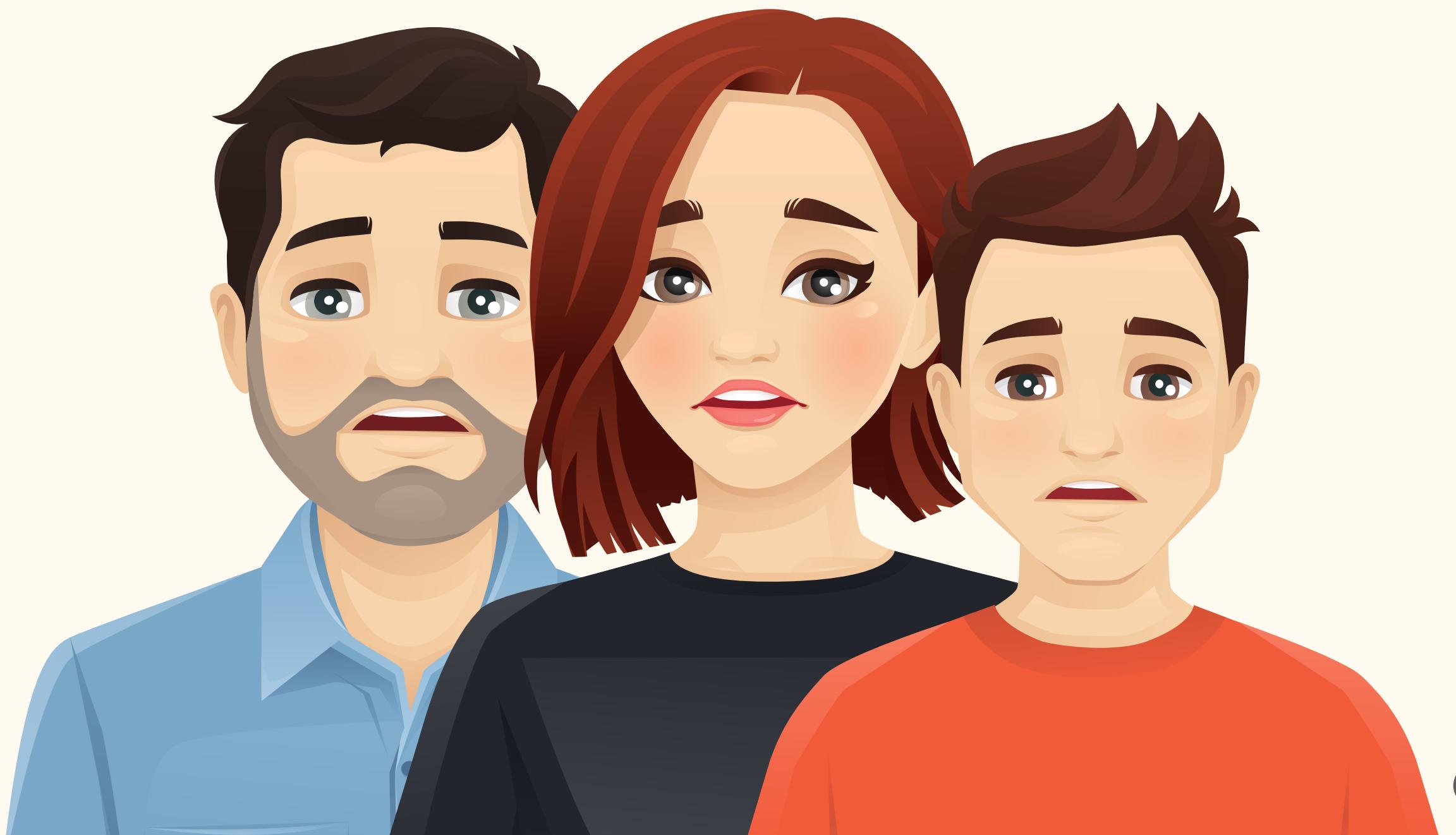
warehouse\_team

warehouse\_team\_checks

warehouse\_team\_critical

warehouse team high





@dmagliola

## Mad

Things that frustrated you in the last i... ↗

- Other teams' jobs screwed us over again :(

- We missed delivery deadlines again with the queuepocalypse 😠. We're going to have some angry customer calls...

- The Purchasing folks have created queues for the month!!! 🤦

- Our queues are getting bigger and bigger!

to help us figure out how to screw up

to figure out how to our queues saner. We can't doing this.

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you in the l... ↗

porting action

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Things that excited you in the last iter... ↗

- Kudos to Sally fixing our queues! 🙌





A job that I was expecting  
didn't run

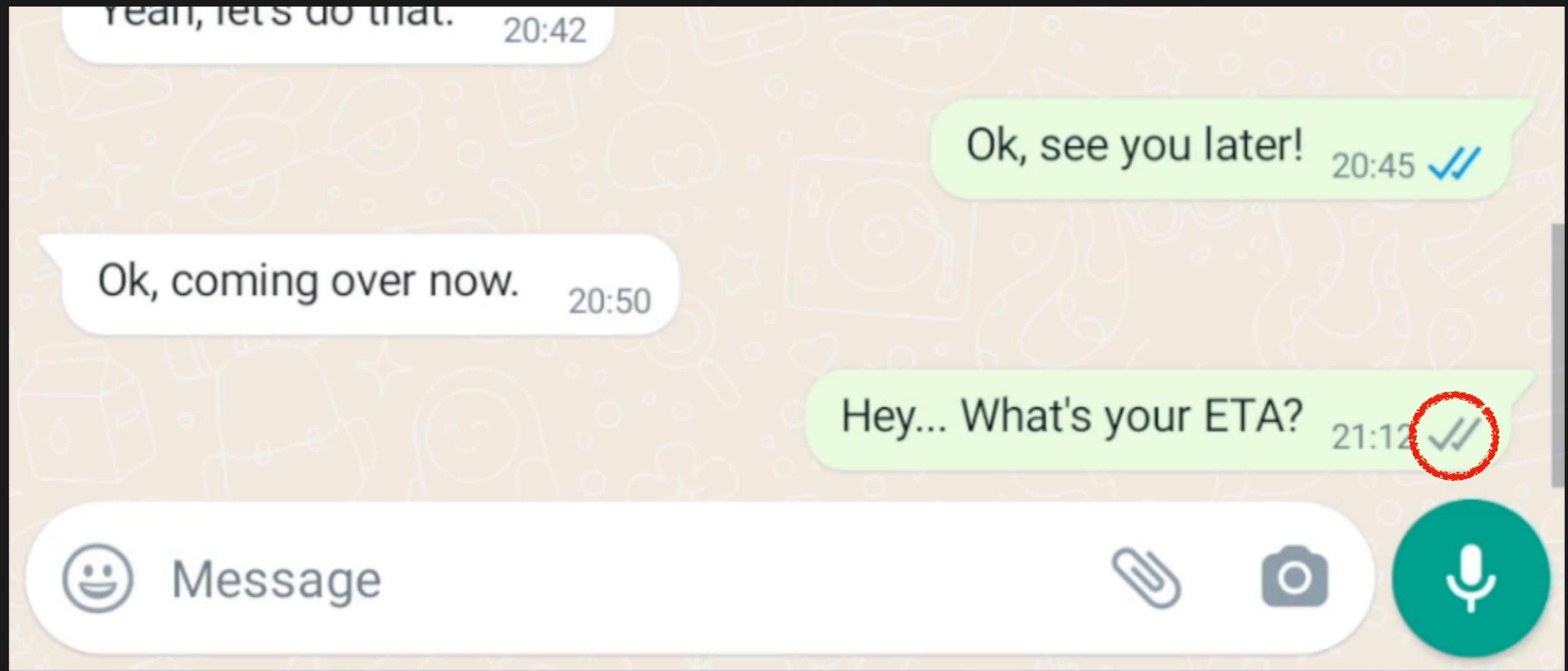
A job that I was expecting

didn't run YET

but I feel that it should have by now

A job  
is running

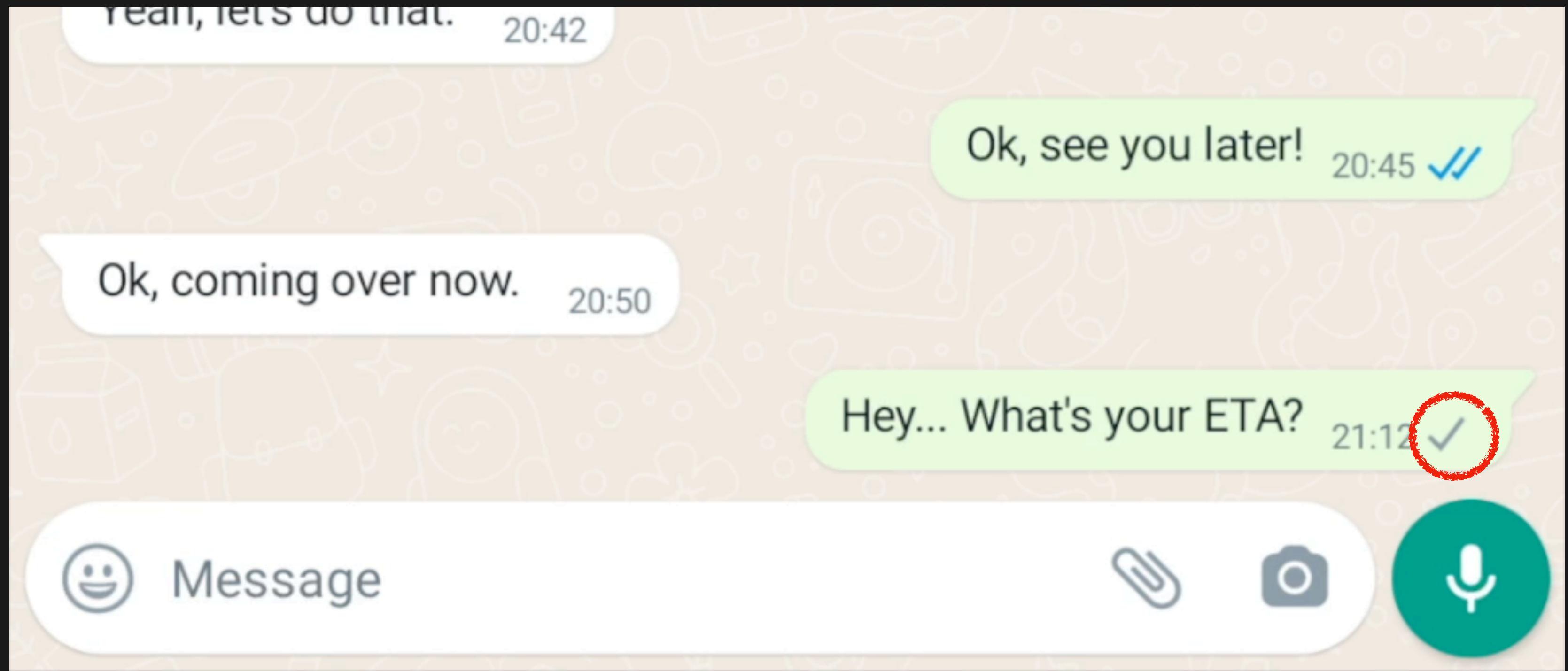
LATE



Sending...

Server got the message...

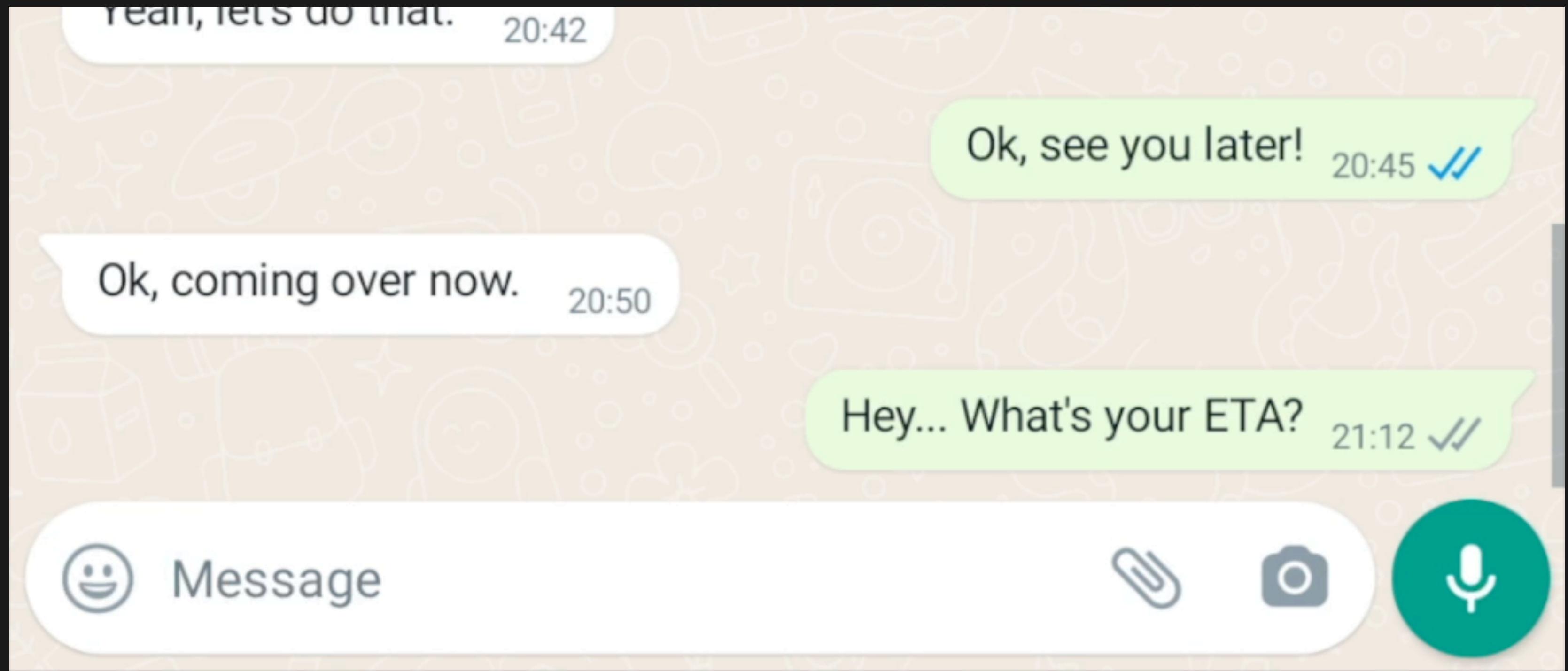
Your friend got the message!



Sending...

Server got the message...

Your friend got the message!



Sending...

Server got the message...

Your friend got the message!

A job  
is running  
**LATER** than I expected

## Queues

Queue	Size	Latency	Actions
critical	0	0	<button>Delete</button>
db_maintenance	0	0	<button>Delete</button>
low	0	0	<button>Delete</button>

## Queues

Queue	Size	Latency	Actions
critical	0	0	<button>Delete</button>
db_maintenance	8,174	1,207.3 (20 minutes ago) 	<button>Delete</button>
low	0	0	<button>Delete</button>

## Queues

Queue	Size	Latency	Actions
critical	8,174	1,207.3 (20 minutes ago) 	<button>Delete</button>
db_maintenance	0	0	<button>Delete</button>
low	0	0	<button>Delete</button>

## Queues

Queue	Size	Latency	Actions
critical	1,528	136.2 (2 minutes ago) 😅	<button>Delete</button>
db_maintenance	0	0	<button>Delete</button>
low	0	0	<button>Delete</button>

## Queues

Queue	Size	Latency	Actions
critical	0	0	<button>Delete</button>
db_maintenance	0	0	<button>Delete</button>
low	8,174	1,207.3 (20 minutes ago) 	<button>Delete</button>

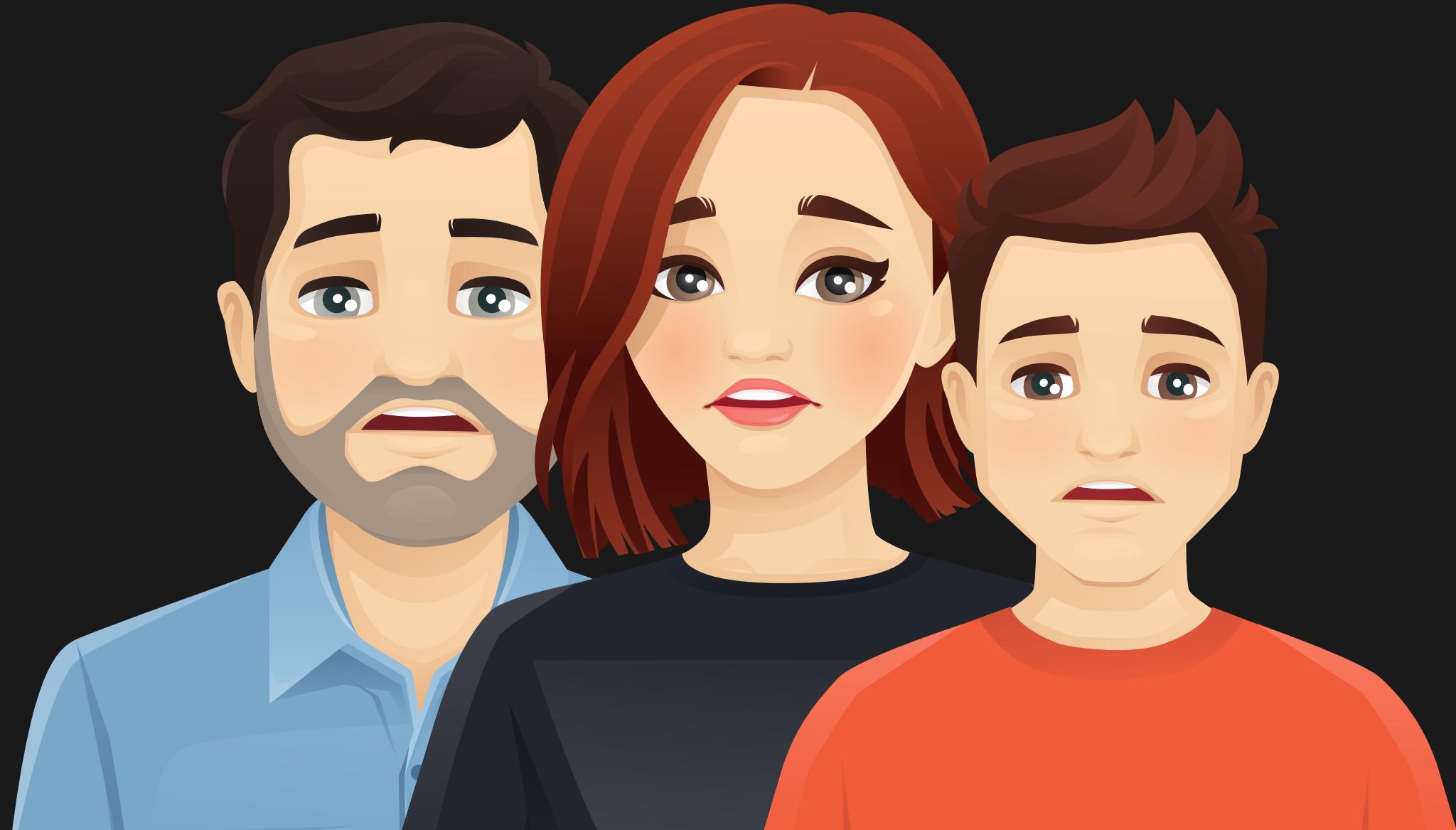
sth. add. ~ to any  
ture; ~ to have a  
**priority** [prai'ɔ:  
right to have a  
have ~ over your  
scale (o

A job  
is running

LATE

# LATENCY

# LATENCY



A job  
is running

LATE

Throughput

Thread Counts

# LATENCY

Hardware!

Replicas

# Queues

Queue	Size	Latency	Actions
default	0	0	<button>Delete</button>
high	0	0	<button>Delete</button>
low	0	0	<button>Delete</button>

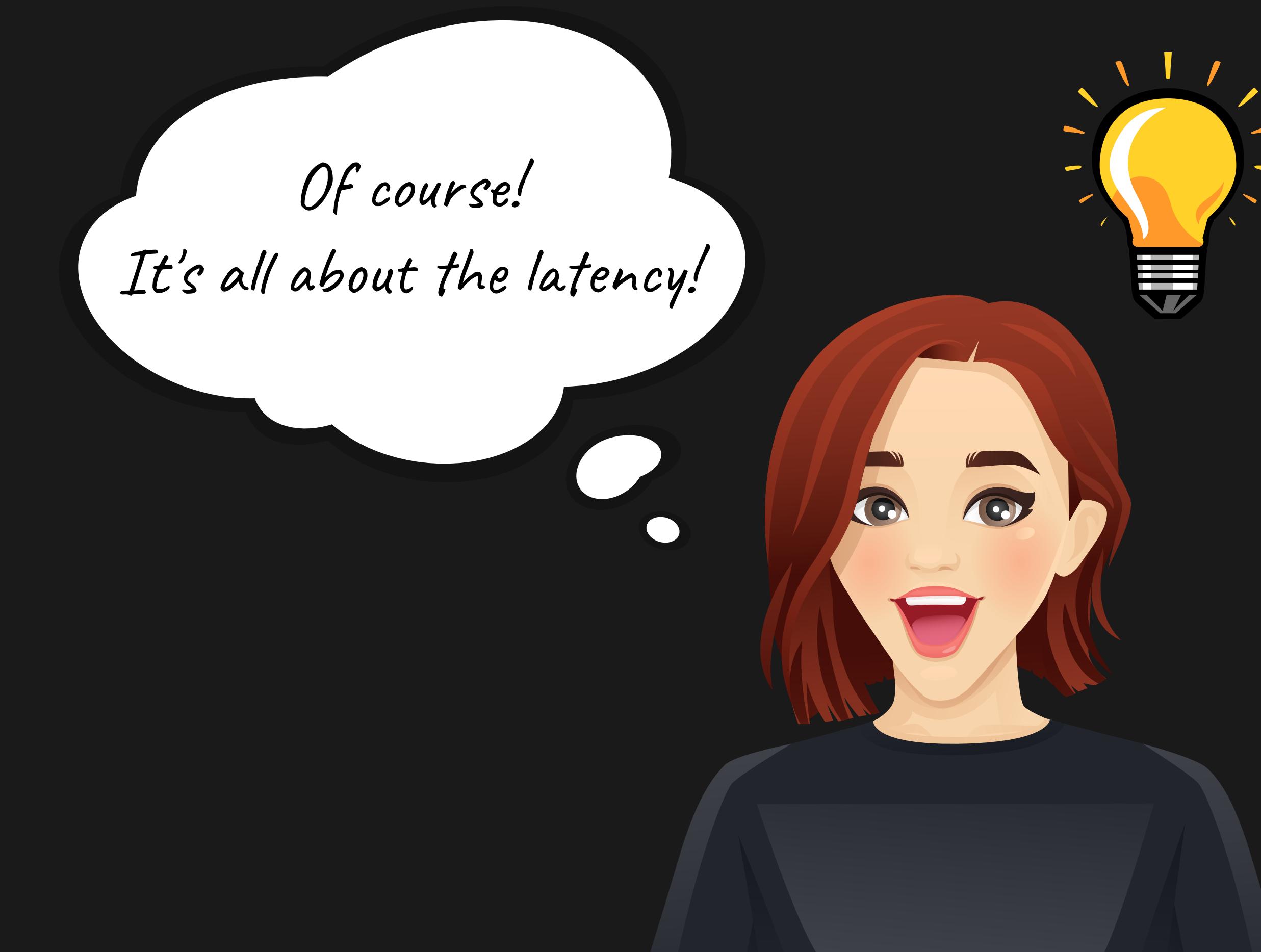
# LATENCY

1. Where does this job go?

# LATENCY

1. Where does this job go?
2. Do we have a problem right now?

# LATENCY



# LATENCY

- Define queues around maximum latency

# LATENCY

- Define queues around maximum latency
  - within\_1\_minute
  - within\_10\_minutes
  - within\_1\_hour
  - within\_1\_day
- Name them after that!

# LATENCY

- Define queues around maximum latency
  - within\_1\_minute
  - within\_10\_minutes
  - within\_1\_hour
  - within\_1\_day
- Name them after that!
- Keep that promise!

# LATENCY

- Define queues around maximum latency
  - within\_1\_minute
  - within\_10\_minutes
- Name them after that!
  - within\_1\_hour
  - within\_1\_day
- Keep that promise!
- Organize your jobs by tolerance to latency

# LATENCY

The answer to life, the universe, and everything?

# LATENCY

Not all jobs are created equal

# Metrics

The first step is knowing you have a problem

# Prevention

“The best things in life  
ain't free

-- Roger Taylor

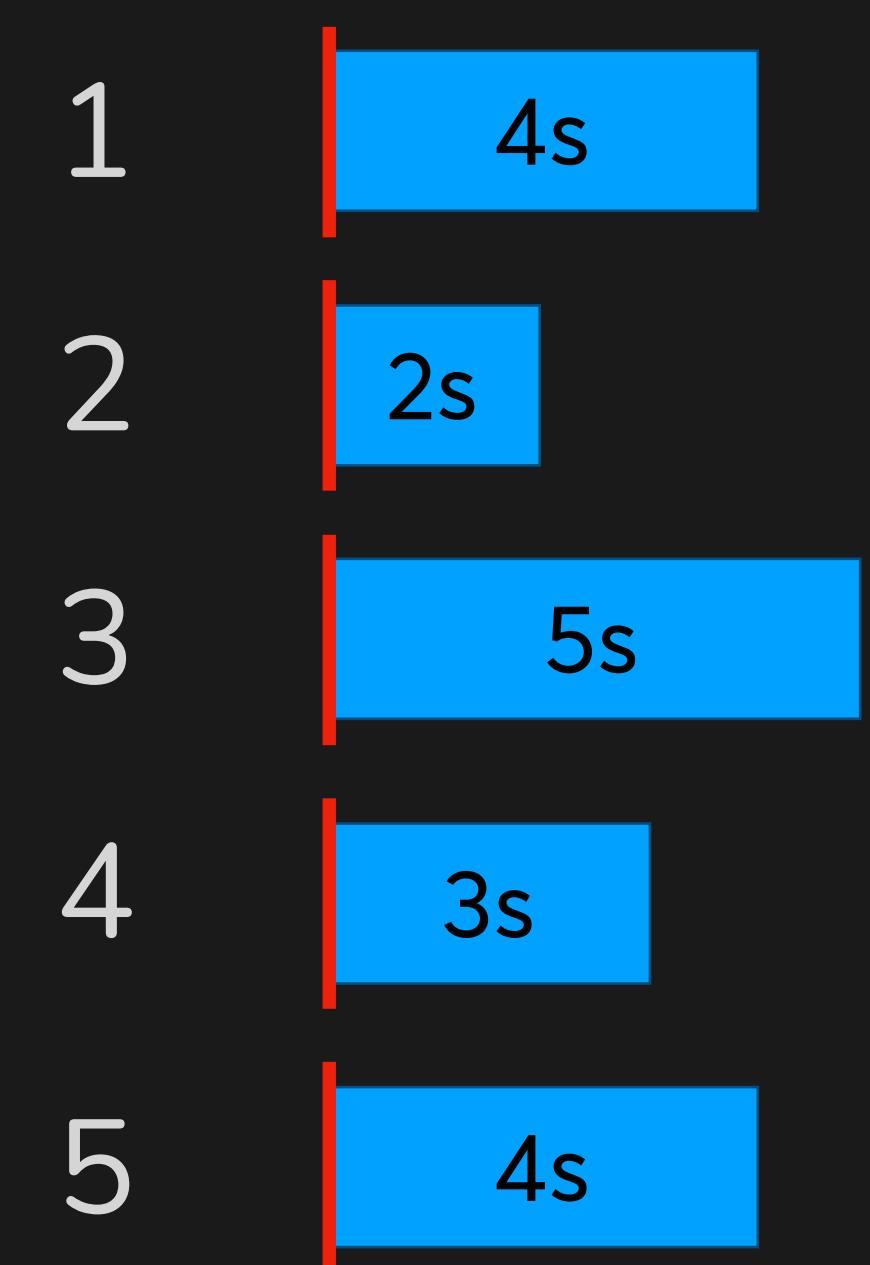
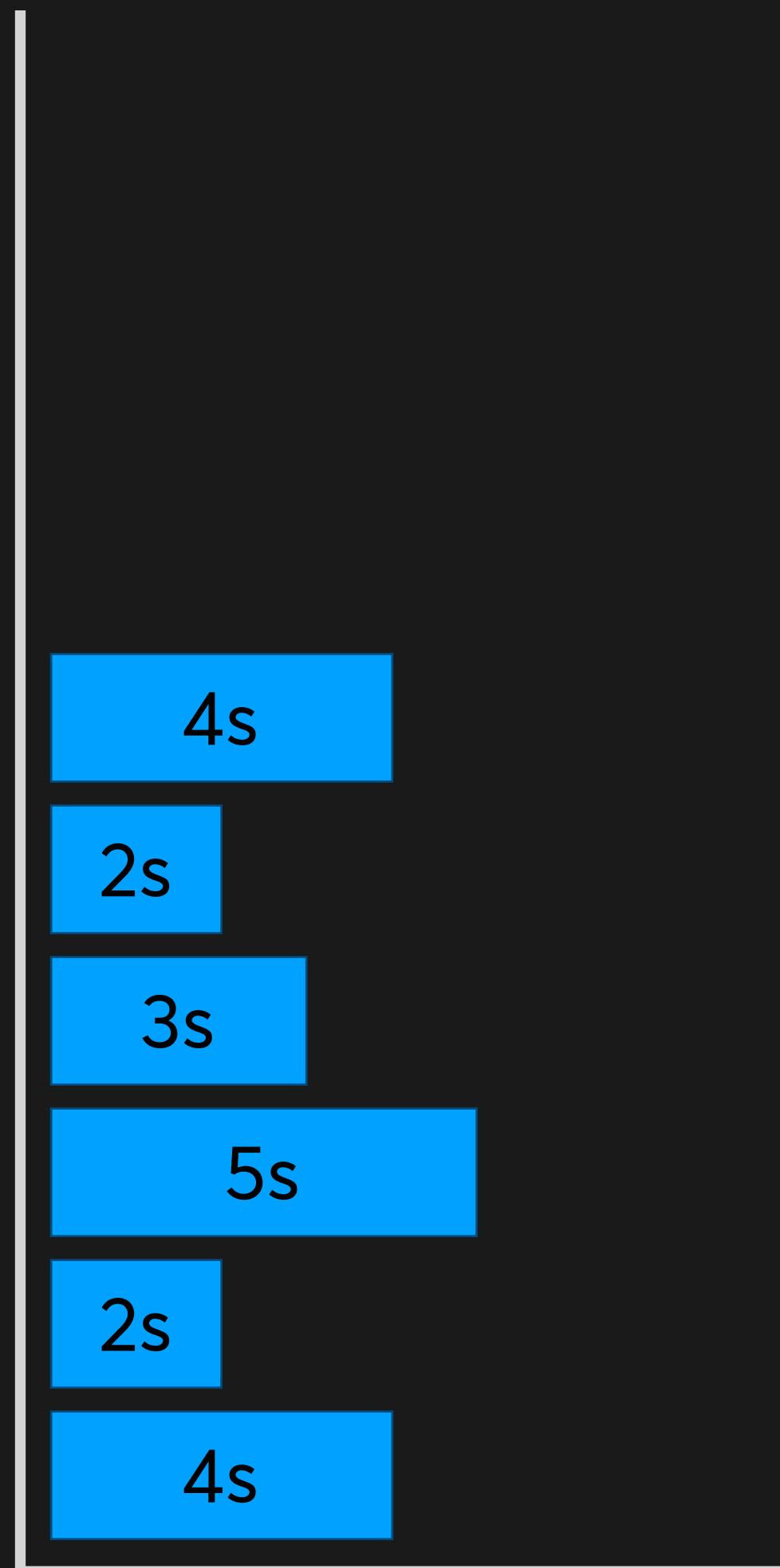


@dmagliola

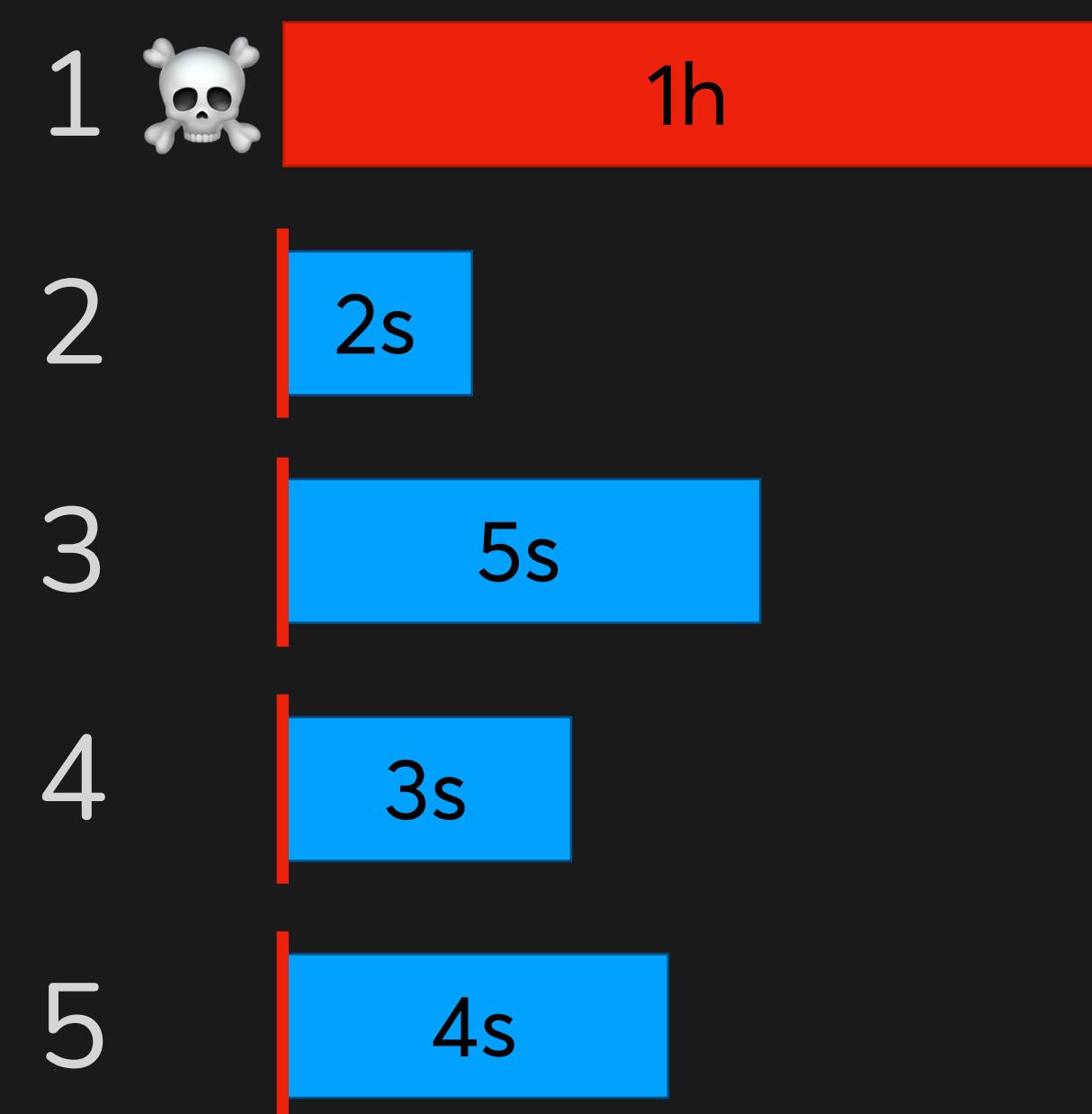
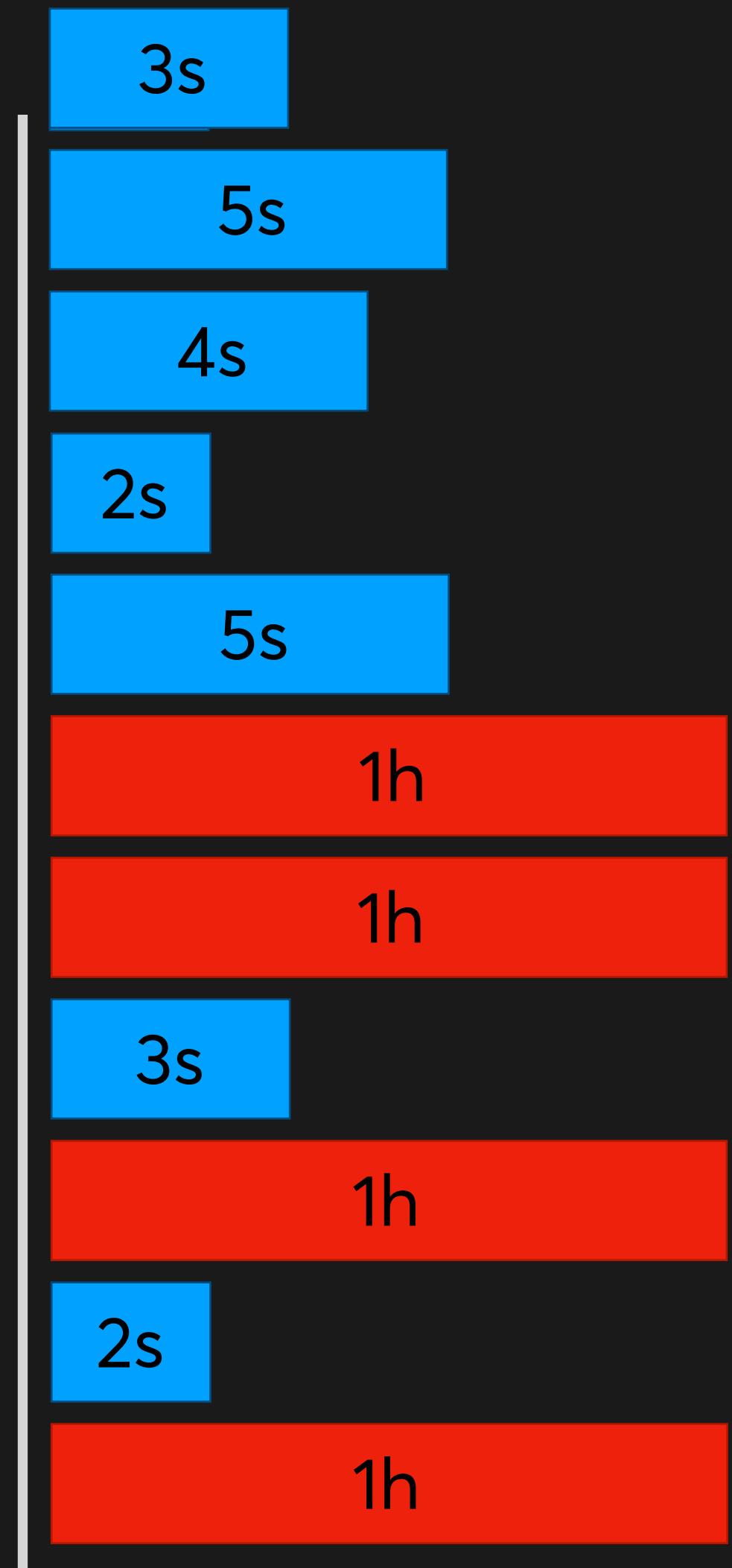


@dmagliola

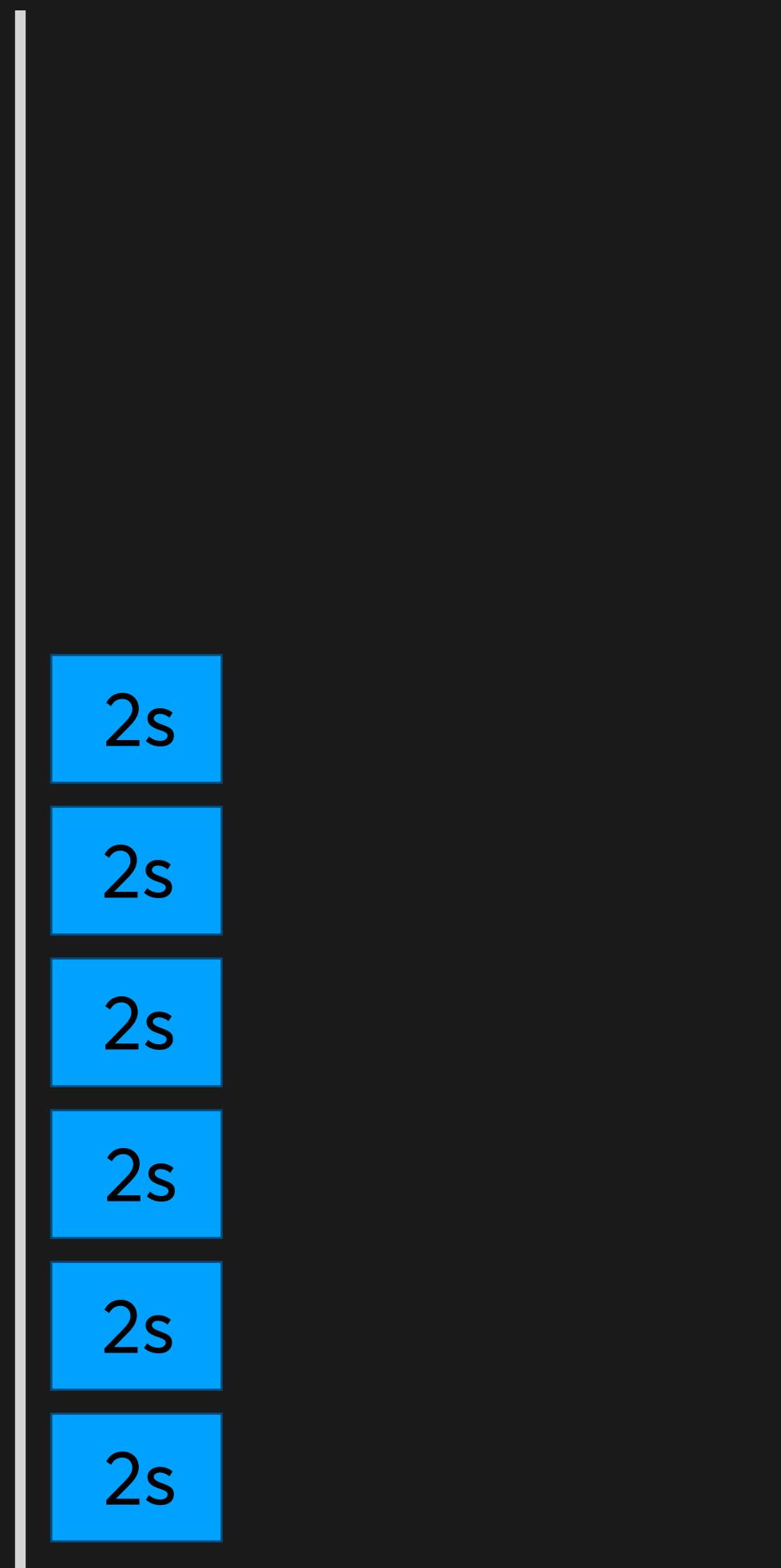
# within\_1\_minute



# within\_1\_minute



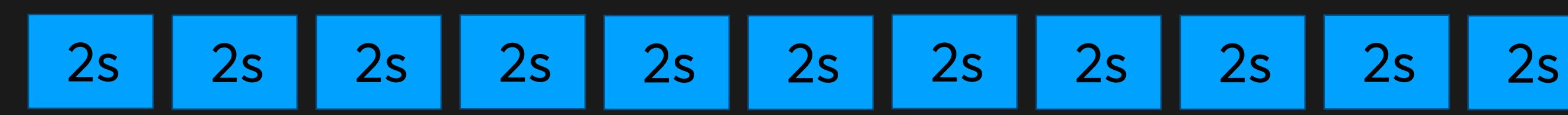
# within\_1\_minute

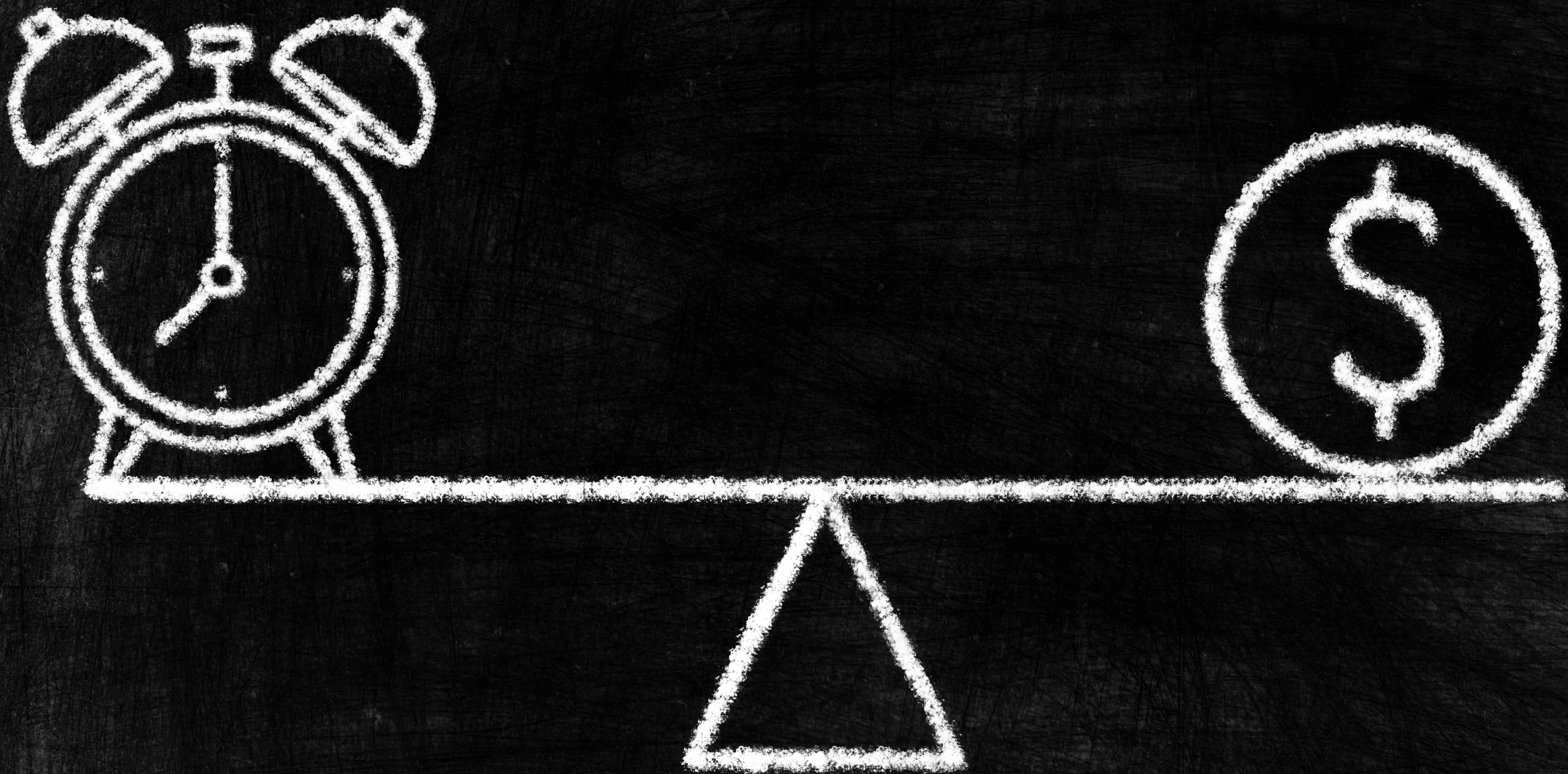


Enqueued jobs

Worker Threads

1





# Time limits (a rule of thumb)

Max queue latency:

`within_1_minute`

`within_10_minutes`

`within_1_hour`

`within_1_day`

You can run for:

6 seconds

1 minute

6 minutes

2.4 hours

# Time limits (a rule of thumb)

1. Detect trespassers

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2. Enforce the rules



# Time limits (a rule of thumb)

1. Detect trespassers
2. Enforce the rules
3. Respect the latency principle!





ACT 4  
*Speedily ever after*



A cartoon illustration of a woman with short brown hair and a wide-open mouth, appearing surprised or excited. A large, white, cloud-shaped thought bubble originates from her mouth, containing the text "Of course!" in a black, cursive font. To the right of the woman, a glowing yellow lightbulb with radiating lines is shown, symbolizing an idea or realization.

Of course!

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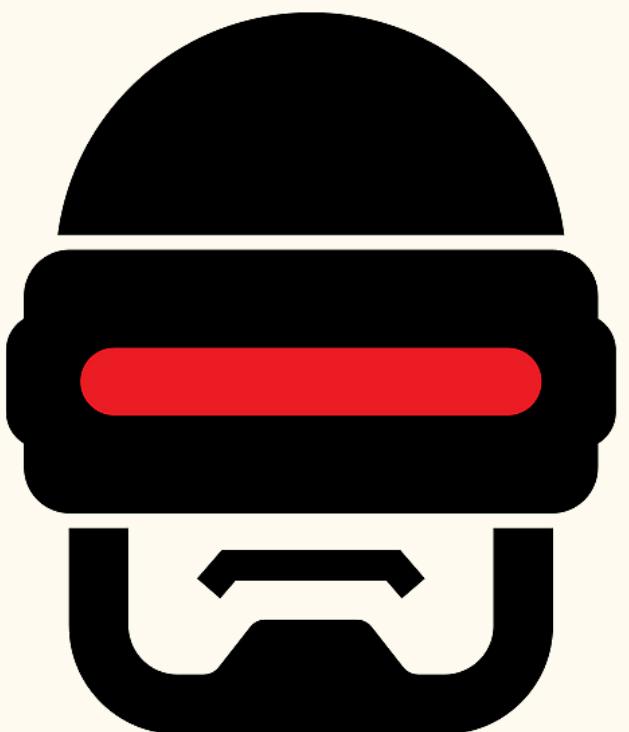
You can run for:

6 seconds

1 minute

6 minutes

2.4 hours





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A cartoon illustration of four people (two men and two women) looking surprised or shocked. In the center is a large pile of various hats and bags, including a pink handbag, a yellow sun hat, a blue fedora, and several colorful scarves and hats.

critical  
notifications  
db\_gathering  
event\_gathering  
purge\_gathering  
pricing\_gathering  
high\_gathering  
nightly\_checks  
warehouse\_team

within\_1\_minute  
within\_10\_minutes  
within\_1\_hour  
within\_1\_day



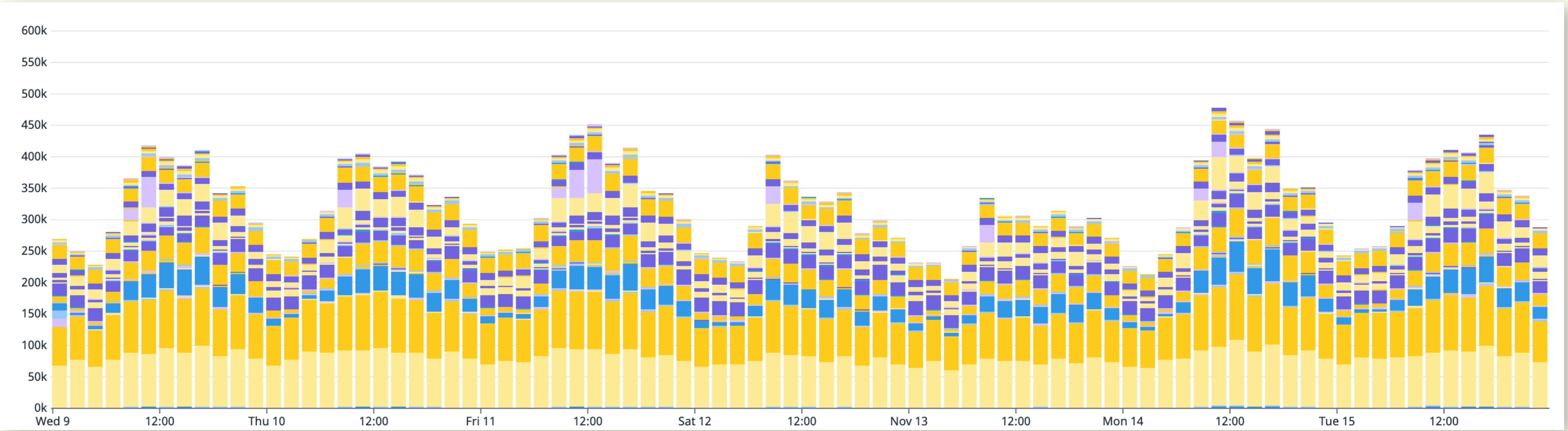
critical  
notifications  
event\_sessions  
purge\_dags  
pricing\_high  
warehouses\_team

within\_1\_minute  
within\_10\_minutes  
within\_1\_hour  
within\_1\_day      nightly\_checks  
db\_maintenance

critical	logistics_team	order_lifecycle	
<u>default</u>	logistics_team_critical	pricing	
event_source	logistics_team_high	purchasing_team	warehouse_team
high	low	purchasing_team_critical	warehouse_team_checks
low	mailers	purchasing_team_high	warehouse_team_critical
metrics	metrics	purchasing_team_low	<u>warehouse team high</u>
notifications	notifications	sales_team	warehouse_team_low
order_lifecycle	notifications_team	sales_team_high	warehouse_team_mailers
webhooks	notifications_team_high	sales_team_low	warehouse_team_printing
	notifications_team_low	surveys	webhooks

			order_lifecycle	
critical		logistics_team		
<u>default</u>		logistics_team_critical	pricing	
event_source		logistics_team_high	purchasing_team	warehouse_team
high	low		purchasing_team_critical	warehouse_team_checks
low	mailers		purchasing_team_high	warehouse_team_critical
metrics	metrics		purchasing_team_low	<u>warehouse team high</u>
notifications	notifications			
order_lifecycle	notifications_team			
webhooks	notifications_team_high			
	notifications_team_low			







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# Queues

Queue	Size	Latency	Actions
default	0	0	<button>Delete</button>
within_10_minutes	0	0	
within_1_day	0	0	
within_1_hour	0	0	
within_1_minute	0	0	



Max queue latency:

**within\_1\_minute**

**within\_10\_minutes**

**within\_1\_hour**

**within\_1\_day**

You can run for:

**6 seconds**

**1 minute**

**6 minutes**

**2.4 hours**



# LATENCY

Not all jobs are created equal

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within\_1\_minute

within\_10\_minutes

within\_1\_hour

within\_1\_day



@dmagliola

# LATENCY

Not all jobs are created equal

@dmagliola

within\_1\_minute

within\_10\_minutes

within\_1\_hour

within\_1\_hour\_high\_memory

within\_1\_day



@dmagliola

# LATENCY

Not all jobs are created equal

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@dmagliola

# LATENCY

Not all jobs are created equal

@dmagliola

within\_1\_minute

within\_1\_minute\_singleton

within\_10\_minutes

within\_1\_hour

within\_1\_hour\_high\_memory

within\_1\_day



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# LATENCY

Not all jobs are created equal

@dmagliola

within\_1\_minute

within\_1\_minute\_singleton

within\_10\_minutes

within\_1\_hour

within\_1\_hour\_high\_memory

within\_1\_day



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# LATENCY

Not all jobs are created equal

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within\_1\_minute  
within\_1\_minute\_singleton  
within\_10\_minutes  
within\_10\_minutes\_high\_io  
within\_1\_hour  
within\_1\_hour\_high\_memory  
within\_1\_day



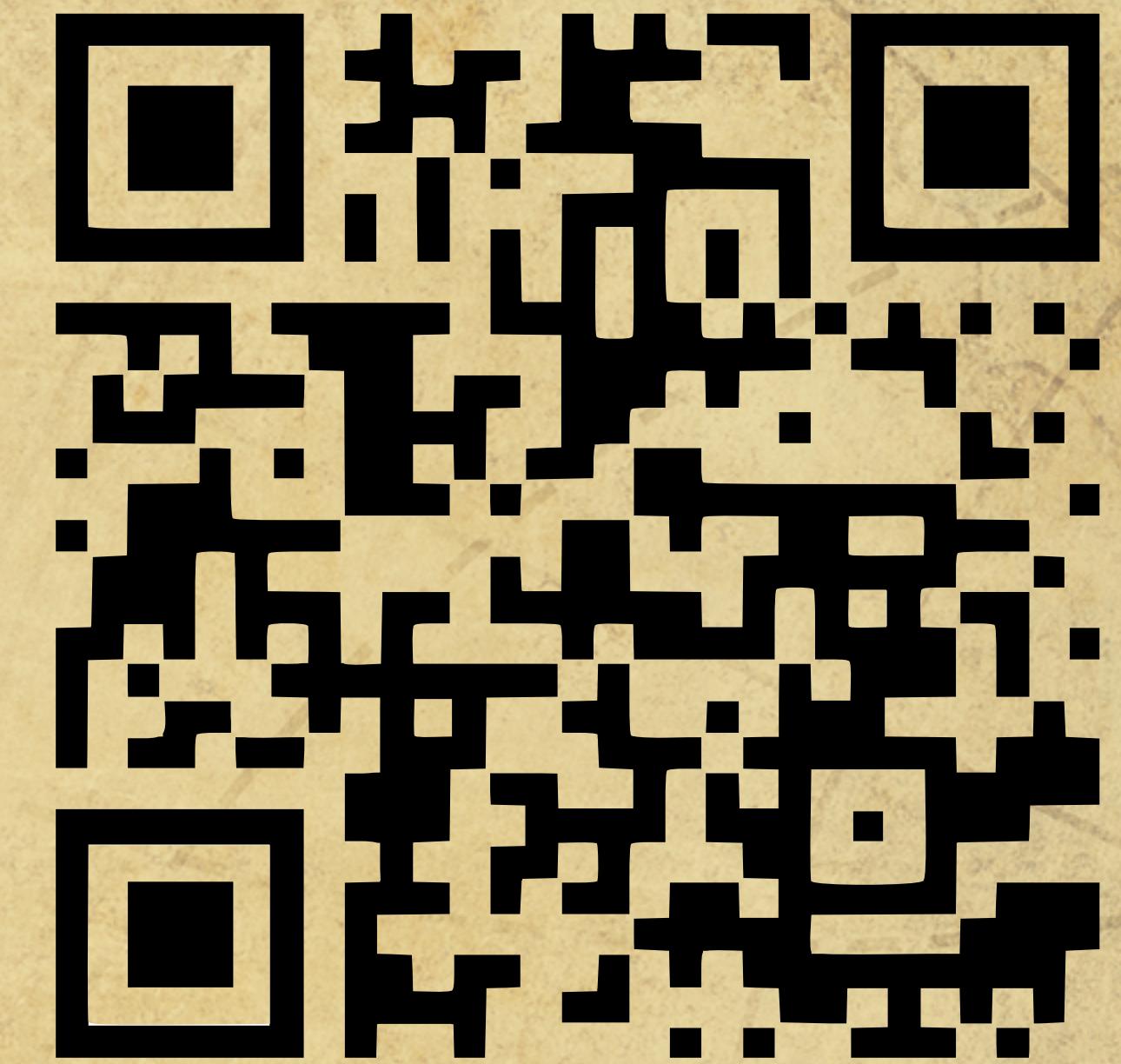
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**fin**

More info and practical advice:

[https://github.com/dmagliola/happy\\_queues](https://github.com/dmagliola/happy_queues)



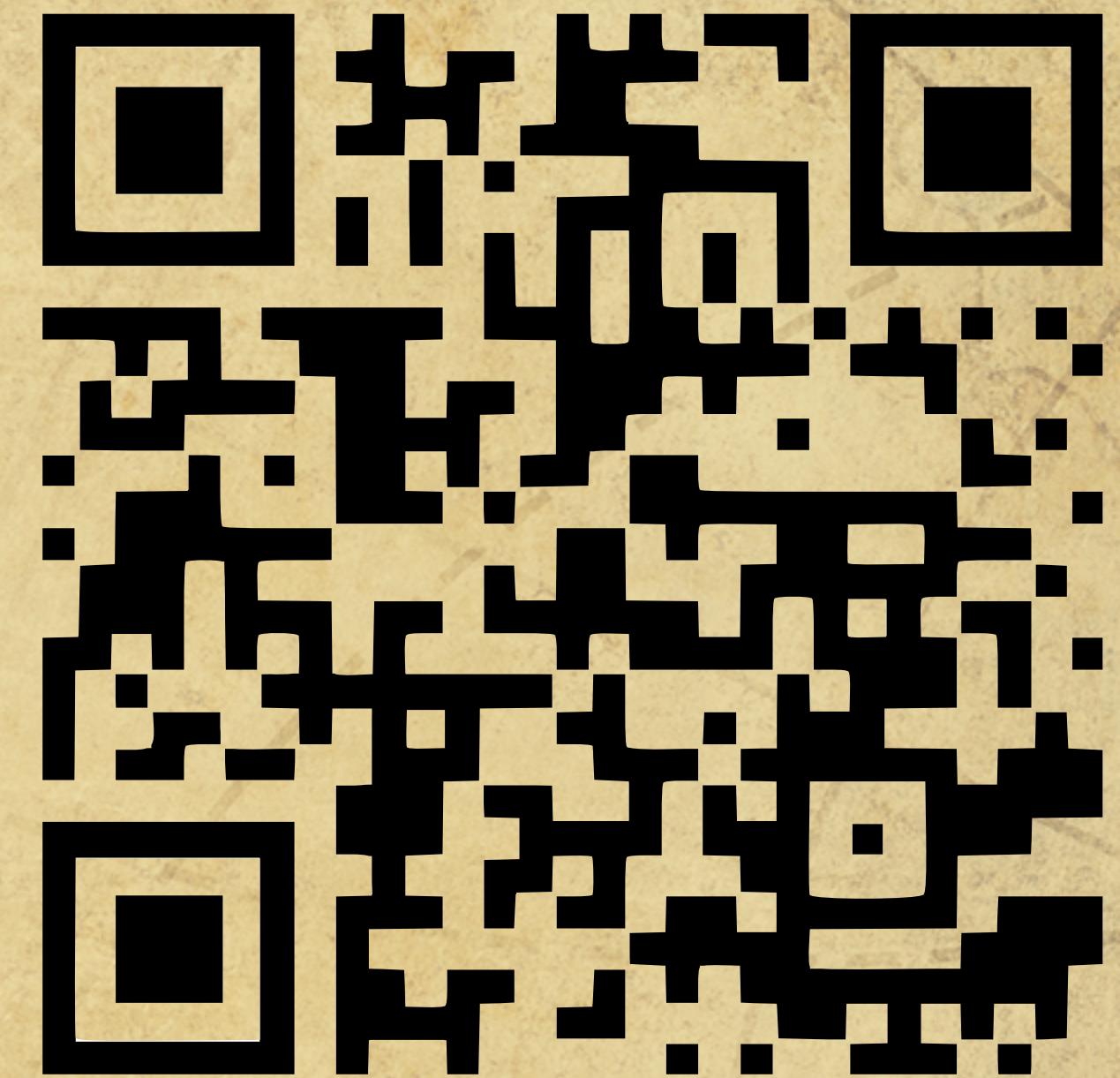
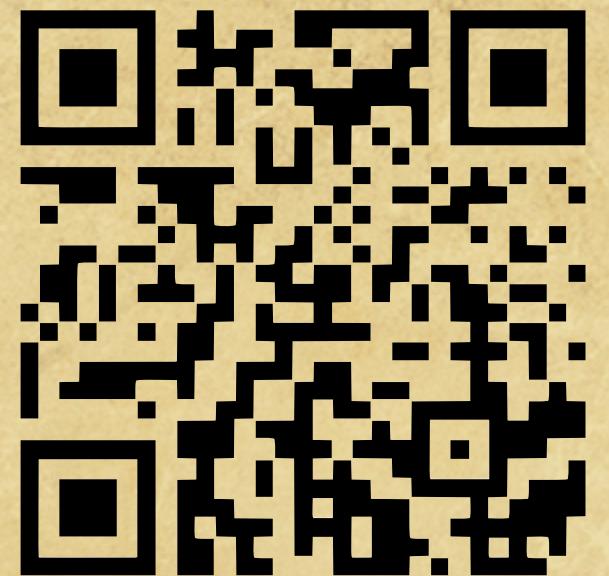
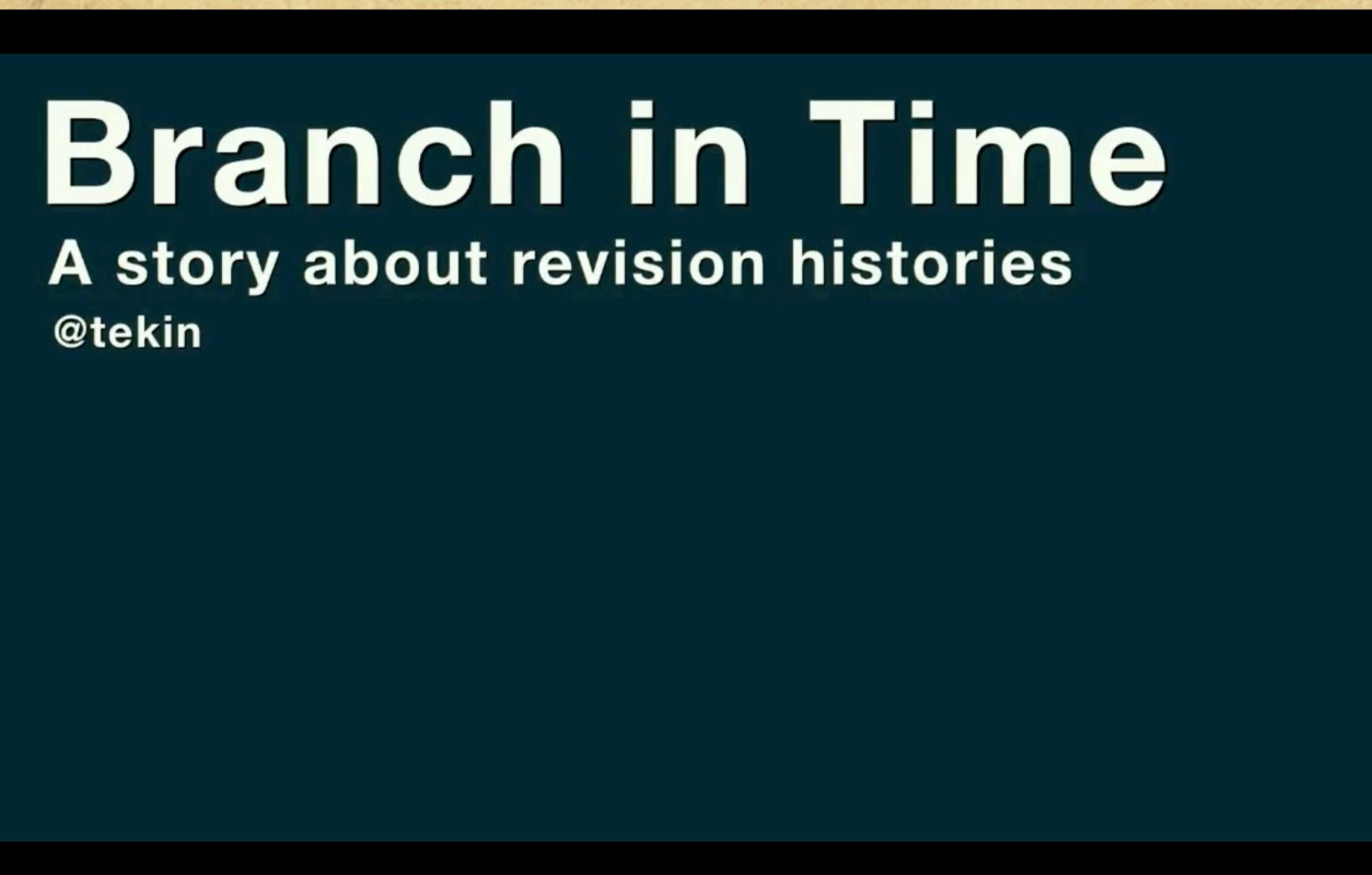
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Thanks to:



Tekin Süleyman (@tekin)



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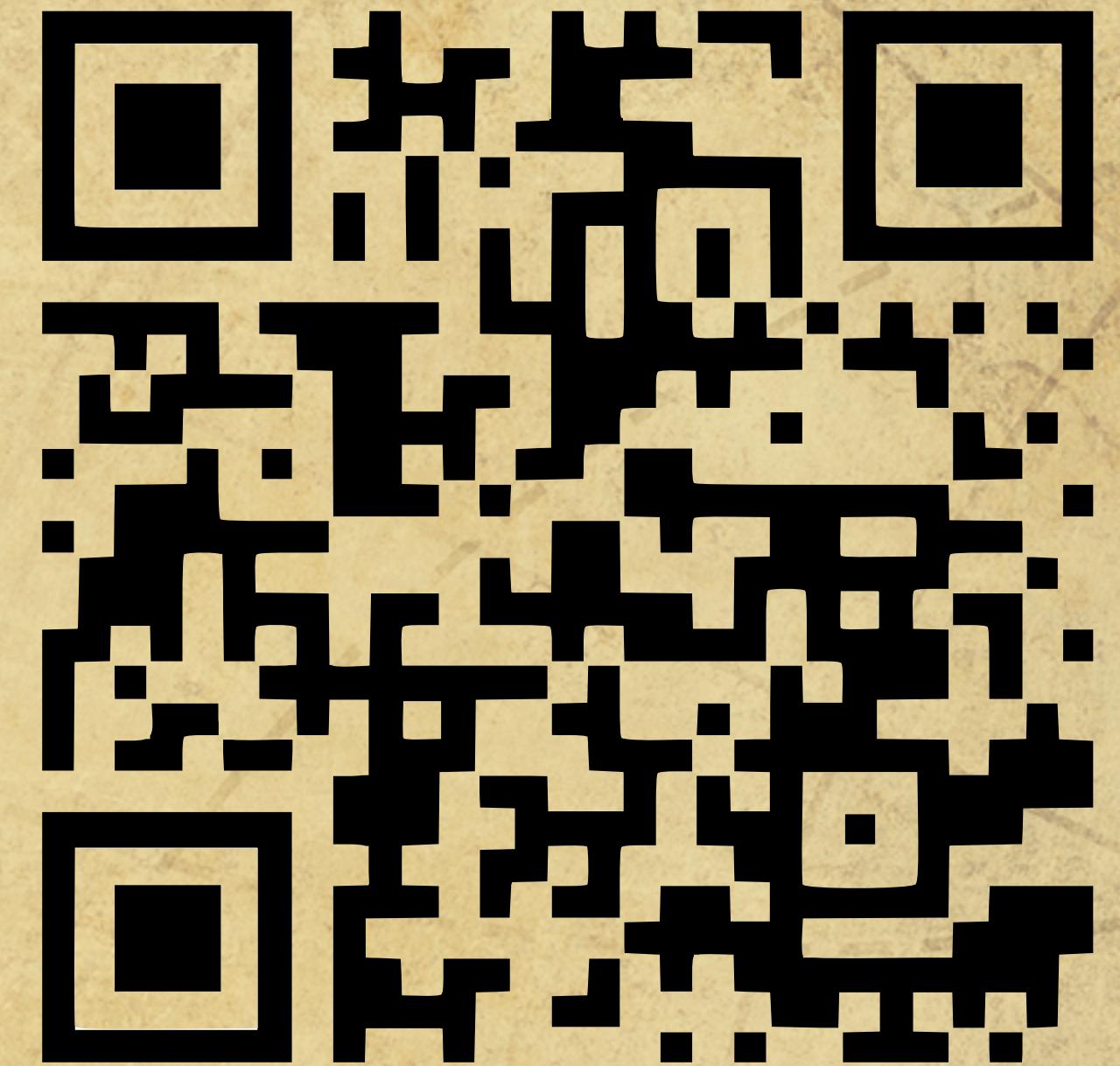
**Lisa Karlin Curtis (@paprikati\_eng)**



**Nick Campbell (@rustypepegasus)**



**Chris Sinjakli (@ChrisSinjo)**



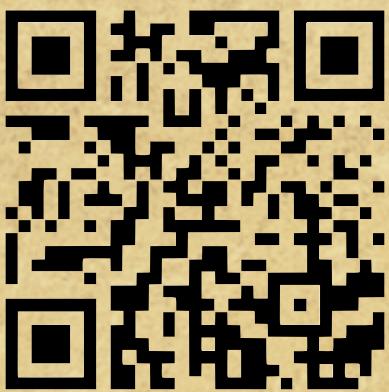
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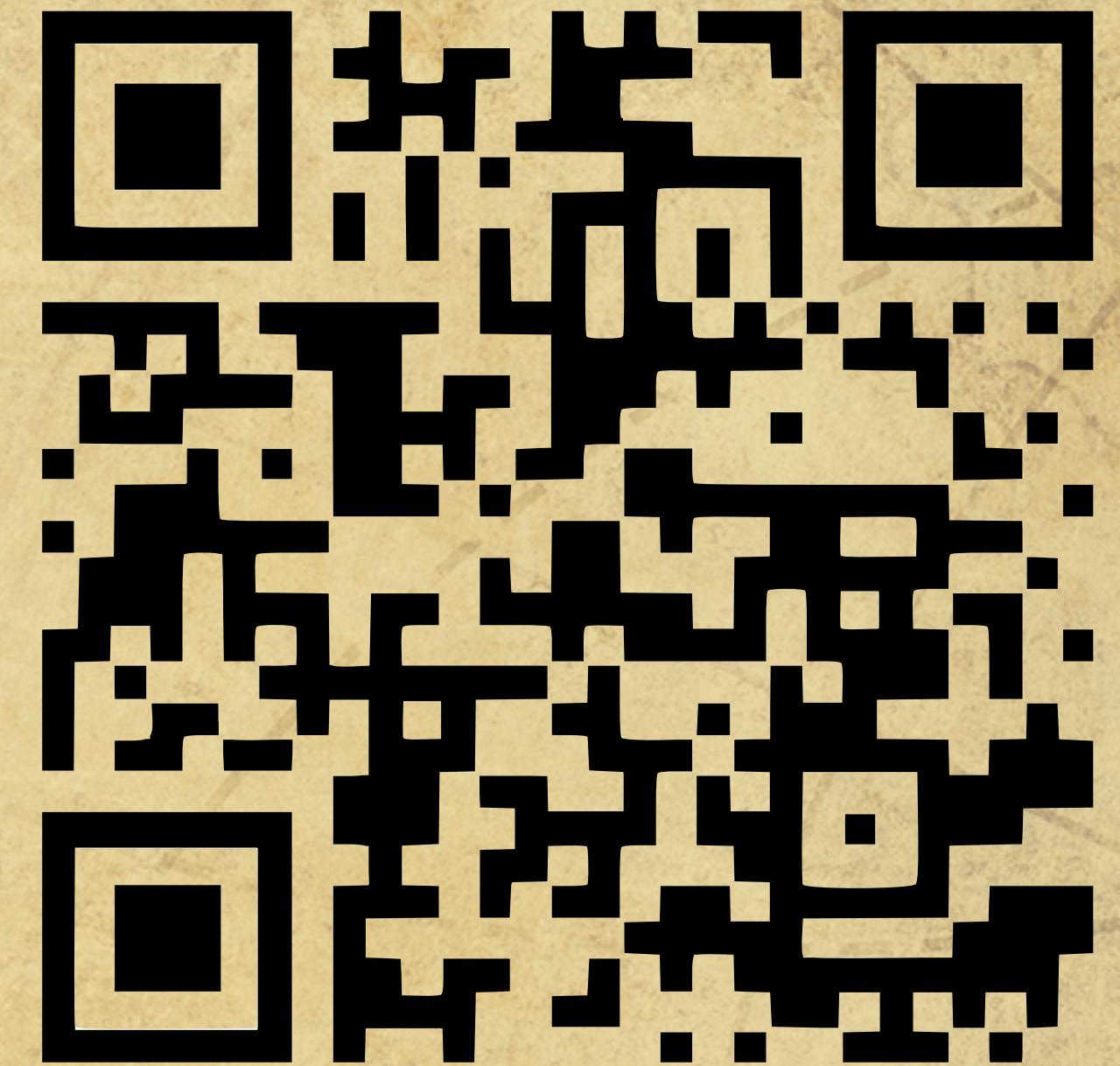
**Nick Campbell (@rustypegasus)**



**Chris Sinjakli (@ChrisSinjo)**



**Neil Chandler at  indeed flex**





# The secret to happy queues

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Daniel Magliola  @dmagliola 



RUBYCONF