

Distributed teams

Scaling operations around the world

Guido Iaquinti



\$whoami

Guido Iaquinti

- Operations Engineer in Dublin 🇮🇪
- Member of the storage team 💾



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Agenda

1. Scalability 
2. SlackOps team history 
3. Breakout discovery 
4. Conclusions 





Scalability



Definition

Scalability

“is the capability of a system, network, or process to handle a growing amount of work, or its potential to be enlarged to accommodate that growth”

- **Administrative scalability:** the ability for an increasing number of organizations or users to easily share a single distributed system.
- **Functional scalability:** the ability to enhance the system by adding new functionality at minimal effort.
- **Geographic scalability:** the ability to maintain performance, usefulness, or usability regardless of expansion from concentration in a local area to a more distributed geographic pattern.
- **Load scalability:** the ability for a distributed system to easily expand and contract its resource pool to accommodate heavier or lighter loads or number of inputs.
- **Generation scalability:** the ability of a system to scale up by using new generations of components



Scalability patterns

Scalability Patterns

Load distribution

Spread the system load across multiple processing units

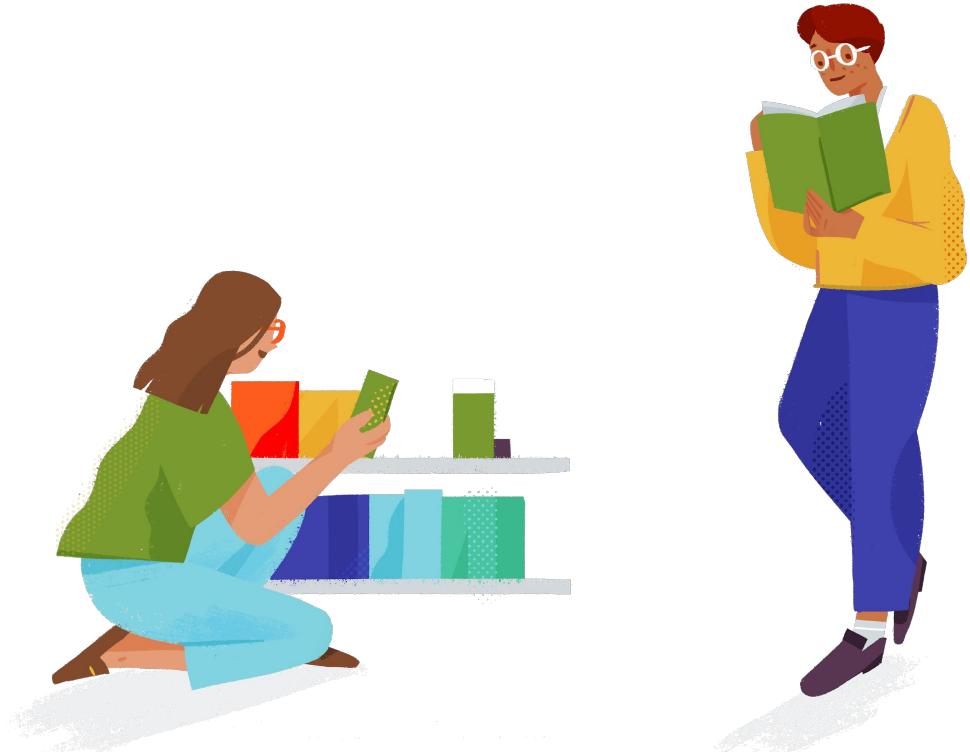
- load balancing / load sharing
- partitioning



Scalability Patterns

Parallelization

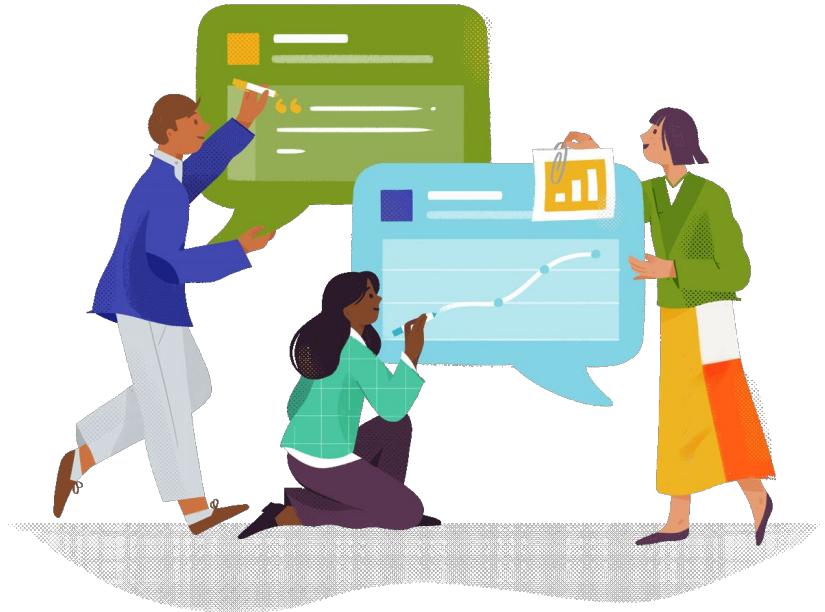
Work on the same task in parallel on multiple processing units



Scalability Patterns

Relaxing of data constraints

Many different techniques and trade-offs with regards to the immediacy of processing / storing / access to data fall in this strategy



Scalability Patterns

Queuing and batch

Achieve efficiencies of scale by processing batches of data, usually because the overhead of an operation is amortized across multiple requests





Can the same scalability patterns be applied to Operations teams?





What's an Operations team?



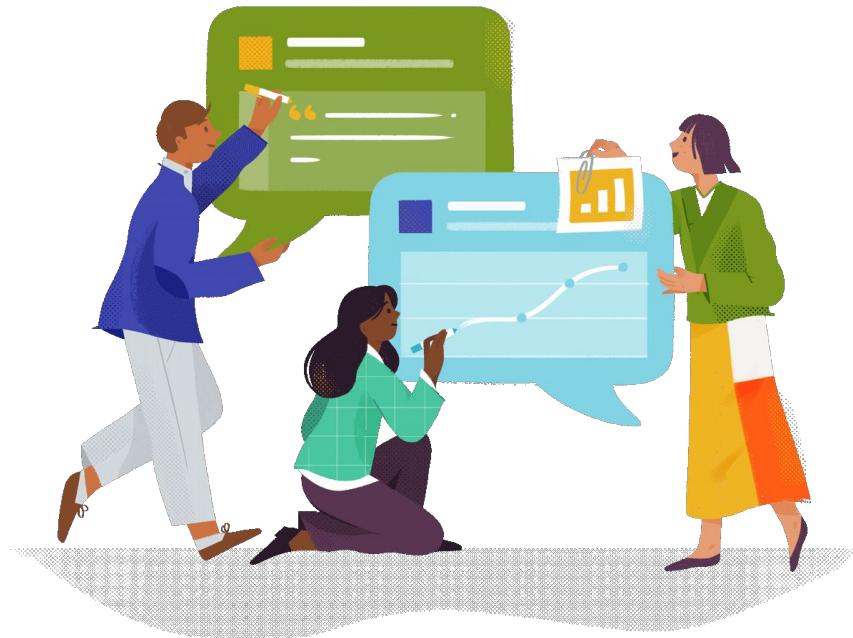


What does it even mean scaling a team?



Operations Team

**tl;dr: design, build, deploy
scale and maintain a 24/7/365
platform**





Scaling a team = hire more?





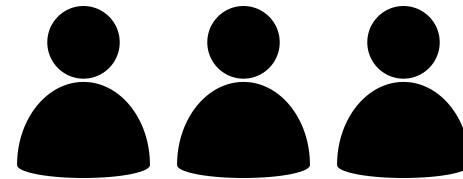
Scaling a team without hiring more?



Scaling a team

Iteration #1

- single operations team
- single office/timezone
- $\text{len}(\text{ops_team_members}) < 5$



Challenges

- what if the infrastructure gets bigger than the head of the engineers?
- on-call 24/7 every 3 weeks?

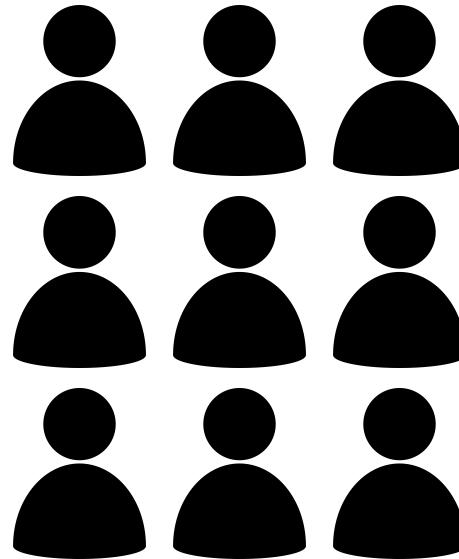
Scaling a team

Iteration #2

- multiple operations teams
- responsibility partitioned
- single office/timezone
- $\text{len}(\text{ops_team_members}) < 5$

Challenges

- how big a team should be?
- which on-call policy? 24/7 every 3 weeks
but with less systems to own?



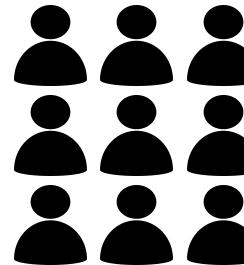
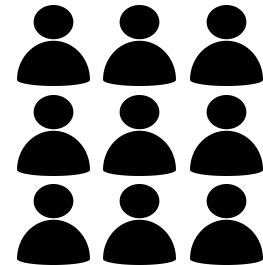
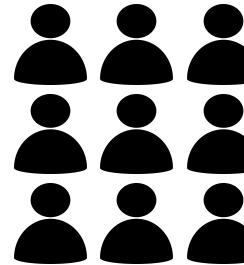
Scaling a team

Iteration #3

- multiple operations teams
- responsibility partitioned
- multiple offices/timezone
- $\text{len}(\text{ops_team_members}) < 5$

Challenges

- timezone zone challenges
- knowledge transfer
- company/team culture





SlackOps Team History



Acme Sites ▾

Victoria Thomas



@ All Threads

★ STARRED

design-work

summer-campaign

🕒 Cory, Tina, Carl

CHANNELS



accounting-costs

brainstorming



business-ops

client-proposal

🔒 design-chat

marketing

media-and-pr

🔓 sonic-fanfic

triage-issues

DIRECT MESSAGES



♥ slackbot

#client-proposal

**Victoria Thomas**

Hey team, hoping to have that proposal ready for the Alaska clients by 3pm today, how are we doing? I can chip in wherever needed!

**Carl Benting**

I'm just about finished putting together the estimate portion of it, I could use some feedback. Here's the google doc I'm working on... docs.google.com/bin/proposal



Q3 OOH – Cost Estimate

Google Drive Document



1

**Victoria Thomas**

The numbers look pretty good, I tweaked a few things, but we're good to go!

**Reena Baines**

I'm just wrapping up the sketches, I'll post them here once I'm done!



About #client-proposal

👤 Channel Details

📌 Pinned Items

👥 12/19 Members

📁 Shared Files

🔔 Notification Preferences

Our mission

“  is on a mission to make your working life simpler, more pleasant, and more productive.”

– Someone at Slack, 2014



About Slack



Public launch: 2014



\$540M in capital raised

Key investors include Accel, a16z, Social Capital, Index, Thrive, GV, Kleiner Perkins, GGV, Horizons, Spark, IVP and DST.



**800+ employees across
7 countries worldwide**

HQ in San Francisco

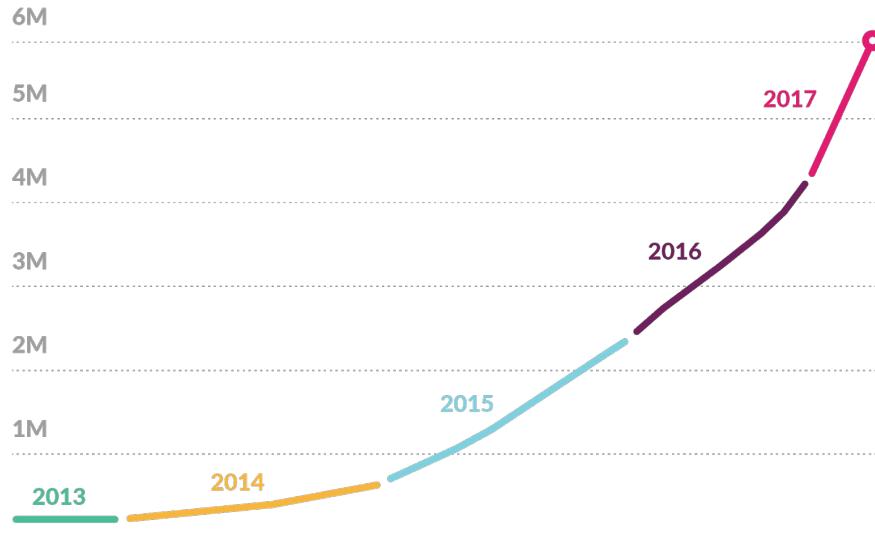


Diverse set of industries

including software/technology, retail, media, telecom and professional services.

An unprecedented adoption rate

Daily Active Users



6M daily active users

2.25 hours of daily active user engagement

55% of users outside the US



2014



SlackOps Team

2014

-  public launch
- single office/timezone (San Francisco 
- everyone does everything: CTO in the on-call rotation with a “catch-all”
core team dealing with any kind of issues 



2015



SlackOps Team

2015

- team segmentation is introduced. Ops team broken down in 4 subteams:
 -  AppOps: DNS, network, frontend tier, WS stack...
 -  StorageOps: database, cache, search, queue...
 -  VisibilityOps: monitoring, logging, metrics, dw...
 -  Build and release: iOS, Android, macOS and Windows Mobile apps
- projects are now “managed” by their dedicated teams
- on-call is still shared due to the limited amount of ppl in each team: when someone is on-call is responsible for the whole infrastructure (DNS, network, frontend, WS stack, database, cache...) 



2016



SlackOps Team

2016

-  Dublin office: ops team not part of the initial bootstrap
 - team bootstrap not really done by anyone: we initially hired an engineer from another company that unfortunately never properly fit with the team
 - I joined after him and I took the responsibility of building our presence in EMEA
-  Melbourne office: ops team part of the initial bootstrap group with CE + Sales
 - we learned from the previous experience and we deployed a SF ops team member in AUS for 1.5 years with the goal of building the team. Awesome work done there ( Derek!)

SlackOps Team

2016

- Introduced “follow the ☀️” on-call 📱 rotation:
 - 🇦🇺 Melbourne: on-call Monday to Friday (0AM-8AM UTC)
 - 🇮🇪 Dublin: on-call Monday to Friday (8AM-4PM UTC)
 - 🇺🇸 San Francisco: on-call Monday to Friday during (4PM-0AM UTC) + weekend

Team structure:

🇦🇺 Melbourne: 1 person on-call 🔥 (👉 Derek!)

🇮🇪 Dublin: 1 person on-call 🔥 (me)

🇺🇸 San Francisco: +15 people in the on-call rotation



2017



SlackOps Team

2017

-  on-call rotation split:
 - each team is only responsible for its own services
 - cross team escalation only for global outages 

Team structure:

 Melbourne: 4 people on-call (3 AppOps + 1 VisOps)

 Dublin: 3 people on-call  (2 StorOps + 1 AppOps)

 San Francisco: ~20 people in the on-call rotation (8 VisOps + 6 AppOps + 5 StorOps)



Breakout Discovery



Breakout Discovery

What worked well

- “follow the ☀️” on-call 📱 rotation improves work/life balance 😊
- as soon as you reach a “critical mass” split the on-call across teams:
 - small teams will feel less 🔥🚒 and more 🔧👷
 - this will also enhance alerts ownership
- building teams in different offices helps as well to:
 - avoid office saturation
 - improve diversity and inclusion

Breakout Discovery

What didn't work that well

- being the only engineer on-call in a region is hard 😞
- bootstrapping an office is hard (hiring awesome people is even harder) 🤝
- scaling a team is more complex than simply hiring people 💻
 - company/department/team culture
 - knowledge transfer

Breakout Discovery

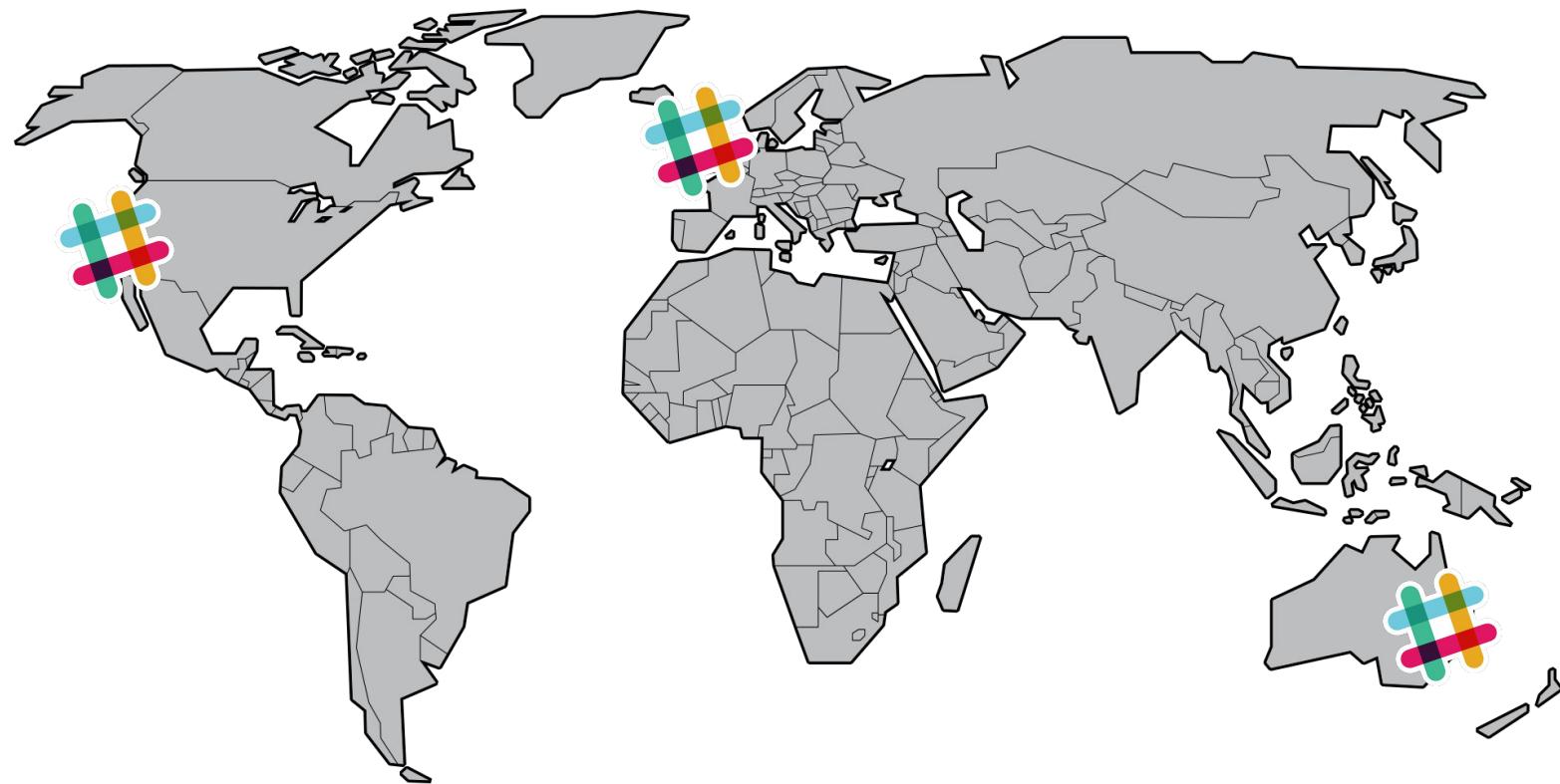




What we learnt



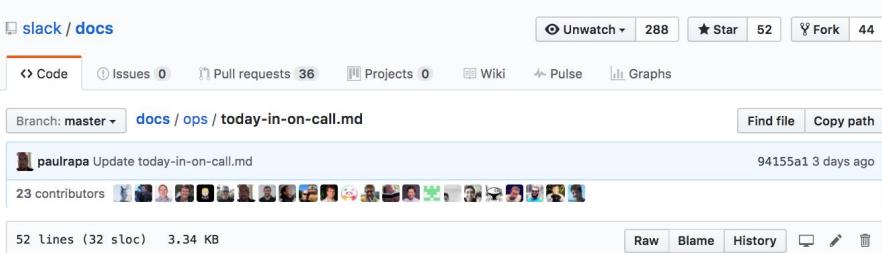
Timezone challenge (UTC-8 to UTC+10)



Documentation

Documentation is essential

- today-in-oncall.md
- incident handoff
- runbooks



The screenshot shows a GitHub repository page for 'slack / docs'. The repository has 288 pull requests, 52 stars, and 44 forks. The current branch is 'master', and the file 'docs / ops / today-in-on-call.md' is selected. A commit by 'paulrapa' titled 'Update today-in-on-call.md' was made 3 days ago, with 23 contributors. The file contains 52 lines (32 sloc) and is 3.34 KB. Below the code editor, there is a section titled 'Today in On-call' with a sub-section '(2017-10-30) Imgproxy / Supra cut over to use ALBs'. It notes that dev and qa environments have been updated to point to new ALBs instead of existing ELBs. Three PRs need to be reverted: <https://slack-github.com/slack/chef-repo/pull/12761>, <https://slack-github.com/slack/chef-repo/pull/12760>, and <https://slack-github.com/slack/chef-repo/pull/12759>. Another section, '(2017-10-26) Dead Pig MS servers', includes a note about reserving servers for testing.

Today in On-call

(2017-10-30) Imgproxy / Supra cut over to use ALBs

The dev and qa environments have been updated to point to the new ALBs instead of the existing ELBs. If things crap themselves the 3 prs that need to be reverted are:

- <https://slack-github.com/slack/chef-repo/pull/12761>
- <https://slack-github.com/slack/chef-repo/pull/12760>
- <https://slack-github.com/slack/chef-repo/pull/12759>

(2017-10-26) Dead Pig MS servers

Please note that ms2xxx servers are reserved for dead pig testing. Do NOT migrate teams to that server if another MS fails, please find a different empty server instead.

Documentation

Documentation is essential

- today-in-oncall.md
- incident handoff
- runbooks

slack / docs

Code Issues 0 Pull requests 36 Projects 0 Wiki Pulse Graphs

Unwatch 288 Star 52 Fork 44

Find file Copy path

giaquinti committed on GitHub Enterprise Update free_space_on_all_disks.md Latest commit 9c002af 7 days ago

..

alerts Update free_space_on_all_disks.md 7 days ago

README.md CDS: add some more debugging info 10 days ago

build_and_deploy.md CDS - extend runbook (#976) 3 months ago

standard_actions.md Update standard_actions.md 10 days ago

Blame History

README.md

CDS (Computed Data Service)

The Computed Data Service (or "CDS") is a service that allows Slack to make available to the webapp dataset generated "offline" (via Spark). You can find more info about it [here](#).

```
graph TD; Webapp -- read --> Logs; Logs -- write --> Spark; Spark --> MySQL; MySQL --> Webapp
```

What to do when something goes wrong

There are specific runbook entries for [alerts](#).

Incident Escalation

You are not alone!

- Incident commander 
- Detailed and clear procedures to escalate incidents 
 - within the team
 - across ops teams (AppOps, StorOps, VisOps)
 - across eng teams (frontend, backend, WS, etc.)
 - across departments (CE, Security, etc.)
 - across providers (Amazon, Google, DigitalOcean, etc.)

Slack is an awesome tool!

How Slack uses Slack to improve geo-distributed work

Slack is where work happens!

- #alerts, #alerts-storops, #ops...
- everything is documented: “*what happened yesterday night to cluster XYZ?*”

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Vitess Operations APP 01:05

A new backup is starting on `slack-vtctld-dev-fra-pgie`

A new backup is starting on `slack-vtctld-073ba740cfffc08d`

A new backup is starting on `slack-vtctld-dev-06e584f786f9ea8ec`

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Patrick Bogen 19:57

ok, here we go.



I'm restarting job_workers.

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jenkins APP 21:41

✓itess build #95 has been promoted to DEV

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Paul Rapa 🌺 08:56

Deploy done, Singapore is live again



Patrick Bogen 🎈 19:57

ok, here we go.



I'm restarting job_workers.



jenkins APP 21:41

✓itess build #95 has been promoted to DEV

Keeping people in the loop

How?

- Partnering with software engineers for projects
- Architecture reviews
- Bi-annual peer feedback & performance review
- Visit the HQ more often than once a year!
- Weekly 1:1 with remote managers
- Cross team 1:1 (#ops-donuts)
- Global recognition (WoTW, #kudos)

Keeping people in the loop

#ops-donuts

Donut, Dusty Pearce

☆ | 3



Search



Monday, October 30th



Donut APP 17:03



@Guido Iaquinti, @Dusty Pearce

☀️ Hello! ☀️

I'm your friendly 🍩🤖, here to help you get to know your teammates by pairing everyone from [#ops-donuts](#) every 4 weeks.

Now that you're here, why don't you pick a time to meet for ☕, 🍔, or 🍩s?
(Or via 💻 if you're in different locations!)

(You can always leave [#ops-donuts](#) if you don't want to receive a pairing in the future.)

Global recognition

#kudos



Kudos Bot APP 20:52

Expand ▲
▼

@ryanpark kudos'd @Guido laquinti: for
*handling a tough day on-call with grace and
helpfulness. You did a great job handling
everything thrown at you!*



Global recognition

#WotW (Win of the Week)



slackbot 17:00

Reminder: Hey! Have you seen a noteworthy bug fix or PR this week that addresses an internal or customer need? Was there a particularly gnarly issue or impactful resolution handled in triage this week? If so, *please recognize your sibs with a Win of the Week nomination*. Submit a description of the effort via <http://wotw.club/>, or just use the reacji on a message that references the PR or work.

Remember, anyone can submit a nomination for great work that you see happen within the team and across the eng org.

Global recognition

#WotW (Win of the Week)



Myles Grant 21:03

🏆 Win of the Week for October 27, 2017! 🏆

I bet you thought something had happened to your old friend WotW. That it had been discontinued. Revamped. Consolidated...

No! Nothing happens to WotW. WotW happens to you. Or in this case, it happens to @maude 

Maude has been on an *absolute tear* in the last week or so, creating tools and documentation to help our engineers do their jobs better:

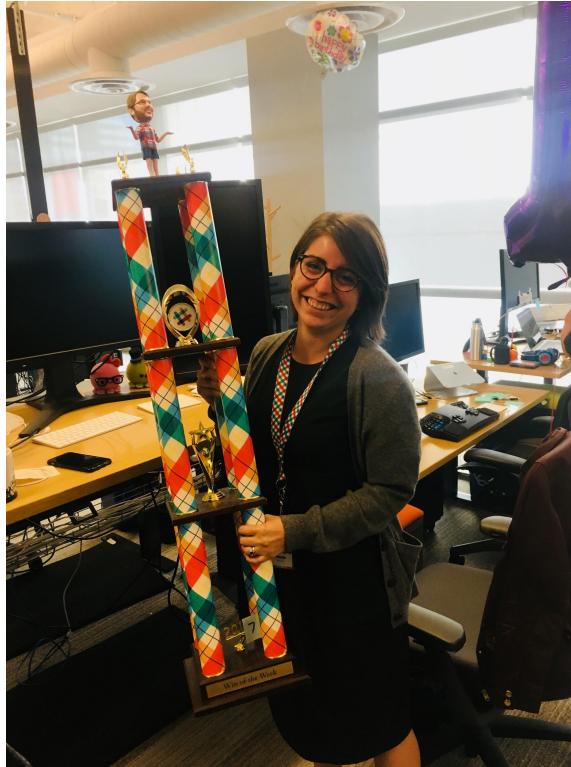
Leveraging the already excellent Slerf tool she created to automatically report on the top used API endpoints and most common arguments, so we can properly direct our attention to making them faster.

Documentation on how to easily wrap your new database tables with unidata libraries.

Improvements to memcached mission control tooling allowing you to check if a given key exists in memcached, and the ability to clear any value (I just used this to debug and fix a problem in `#triage-core` yesterday, and it saved a ton of time.)

Global recognition

#WotW (Win of the Week)



Global recognition



Global recognition



Global recognition



Cal Henderson (CTO)



Conclusion

What I learnt

Bootstrapping a team is hard

Especially if in the meantime you have to:

- keep Slack up and running 
- Work on projects 
- Attend/prepare meetings 
- Manage Mentoring and Onboarding 

What I learnt

-＼(ツ)／-

- No one is Superman
- There's no emergency that you can handle and other people can't
- On-call burnout is real 😞
- Increase HQ awareness before a problem became an emergency

What I learnt

Work/life balance matters

- Work hard 💪 go home 🏠
- Disable notifications outside business hours 😴
- Don't reply to DMs outside your business hours

What I learnt

If you are working in the HQ

Always do an extra mile for your team mates working remotely!

- always ask yourself: “how does this change affect employees in other time zones?”
- give to their PRs the highest priority
- don’t schedule meetings too late in their day
- take over important work if it’s already too late in their day
- make sure your code is documented and easy to understand
- make sure they are aware of infrastructure changes or ongoing maintenance

What I learnt

Being a guest (visiting HQ)

- Spend more time talking with people than writing code
- Focus on meetings and project planning
- Have fun with colleagues!

Being a host (for visitors from HQ)

- Increase awareness of the challenges of working remotely
- Share your experience
- Have fun with colleagues!

What I learnt

Being a guest (visiting HQ)

- Spend more time talking with people there
- Focus on meetings and project planning
- Have fun with colleagues!



Being a host (for visitors from HQ)

- Increase awareness of the challenges of working remotely
- Share your experience
- Have fun with colleagues!

What I learnt



of working remotely

What I learnt



What I learnt





QA



github.com/guidoiaquinti



twitter.com/guidoiaquinti



Thank You!

...we are hiring! slack.com/jobs



Bibliography & Credits

- <https://en.wikipedia.org/wiki/Scalability>
- <http://thebigsoftwareblog.blogspot.ie/2010/08/scalability-fundamentals-and.html>
- https://upload.wikimedia.org/wikipedia/commons/thumb/4/41/Simple_world_map.svg/2000px-Simple_world_map.svg.png
- https://upload.wikimedia.org/wikipedia/commons/7/76/Slack_Icon.png
- <http://nearby-pla.net/images/library/all-the-things/all-the-things-blank-clean-template-transparent-background-huge.png>
- <http://clipart-library.com/images/AibKGkpbt.png>
- https://upload.wikimedia.org/wikipedia/commons/thumb/c/c6/World_-_time_zones_map_%282014%29.svg/2000px-World_-_time_zones_map_%282014%29.svg.png
- https://i.kinja-img.com/gawker-media/image/upload/s--JSQTDb70--/c_scale,f_l_progressive,q_80,w_800/vsvsuay9ofu51z6fiaxg.jpg