Web Apps

Why we need them and how to make them easier

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Steve Conklin

Service Reliability Engineer

Heroku

Overview

- Why does Amateur Radio need Web apps?
- What is Heroku & Why is it awesome?
- 12 Factor Philosophy
- Request Path through Heroku
- Dynos, Databases & Add-ons
- Pipelines, Private Spaces, Connect, Kafka

Why do we need web apps?

Standalone Operations are essential

Take Phase4B for example . . .

- Voice Communications
- Voice Chat (possibly)
- Station-to-station Data
- Station-to-many Data
- Text and other applications using this connectedness

Phase4B is entirely digital and routed packets, isn’t that a network?

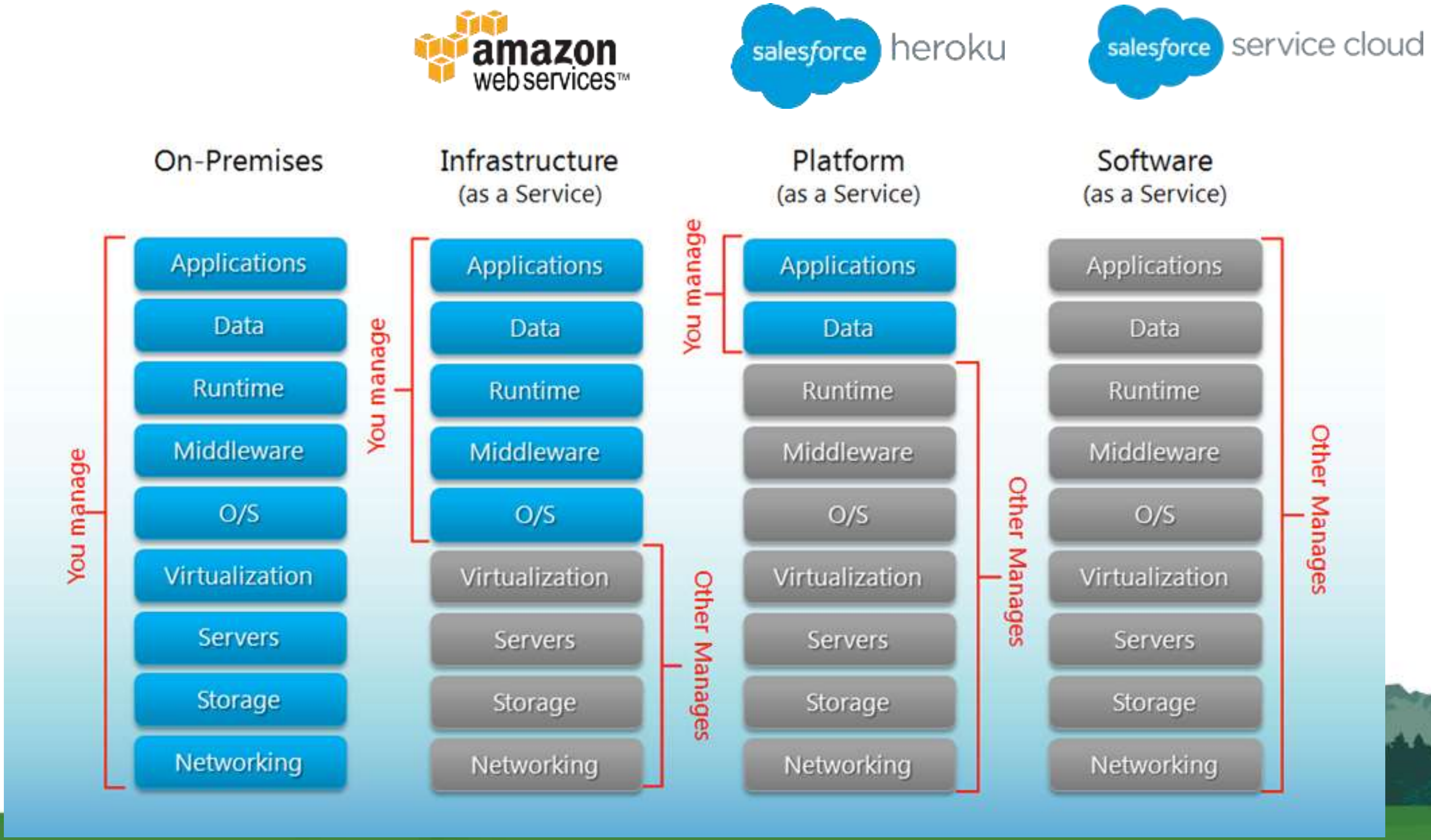
What do we get by extending connectivity to the internet?

- Access to software updates
- Access to served agency resources
- Authentication and identity servers
- Logging applications
- Access to Phase4B for those without a ground station
- Access to email gateways
- And anything else we can think of

What is Heroku?

And why should we use it?

What is Heroku?



amazon web services™

salesforce heroku

salesforce service cloud

On-Premises

You manage

Applications

Data

Runtime

Middleware

O/S

Virtualization

Servers

Storage

Networking

Infrastructure (as a Service)

You manage

Applications

Data

Runtime

Middleware

O/S

Other Manages

Virtualization

Servers

Storage

Networking

Platform (as a Service)

You manage

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Networking

Software (as a Service)

Other Manages

Applications

Data

Runtime

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Virtualization

Servers

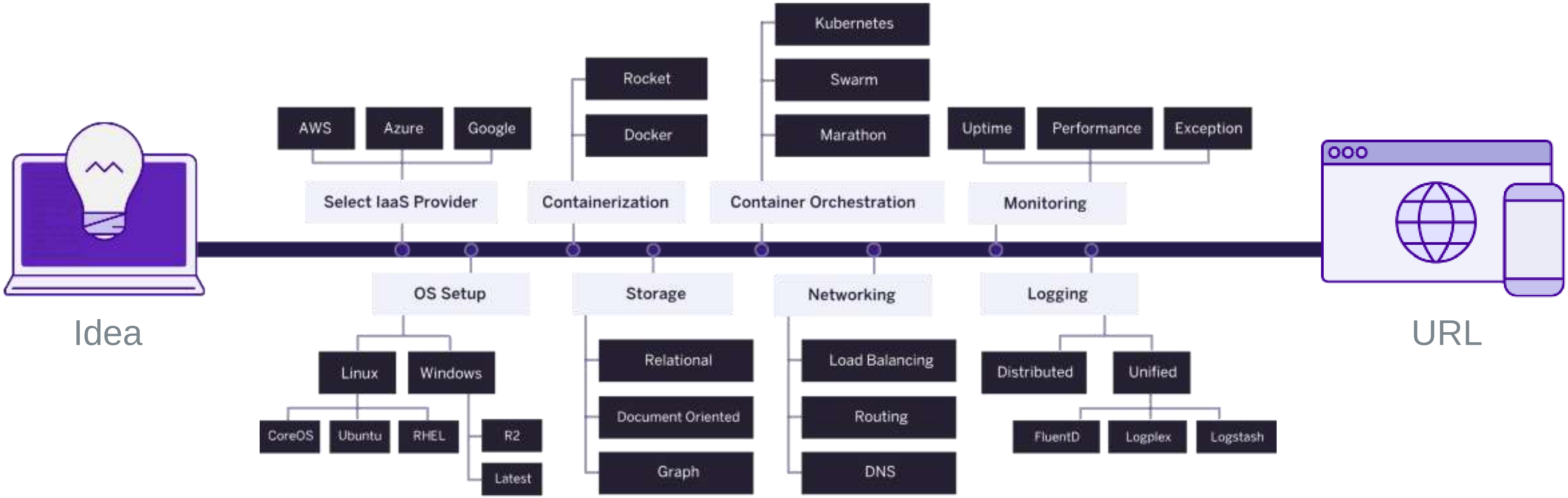
Storage

Networking

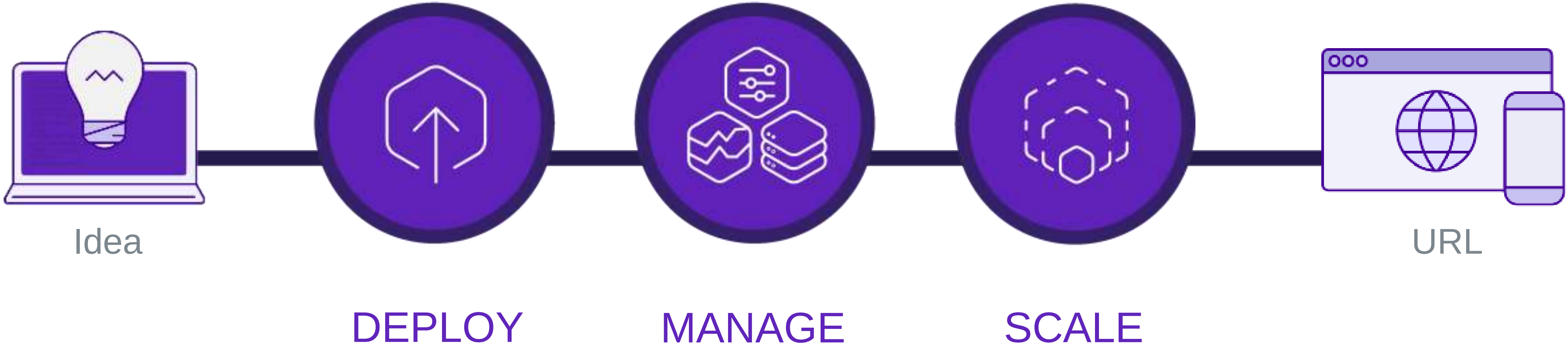
What is Heroku?

Heroku is a cloud platform that lets companies build, deliver, monitor and scale apps — we're the **fastest way to go from idea to URL**, bypassing all those infrastructure headaches.

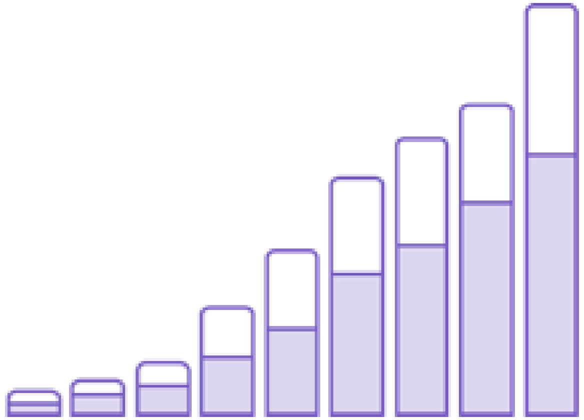
Deploy, manage, and scale



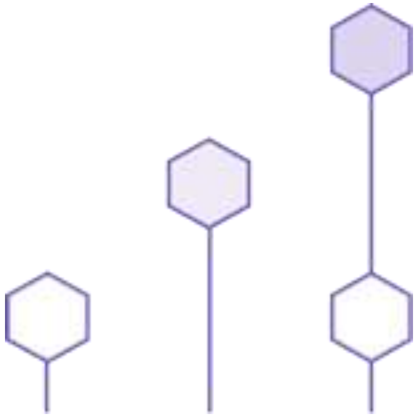
Deploy, manage, and scale



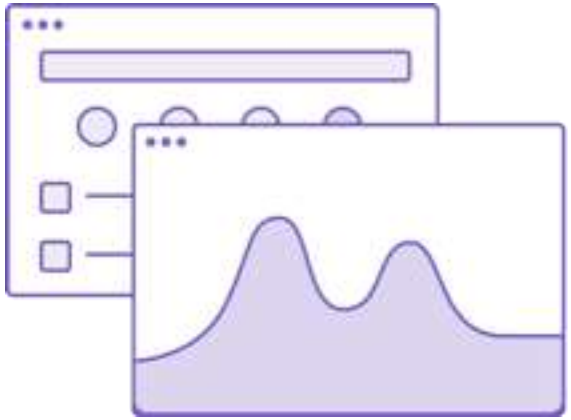
Heroku by the numbers



13 Billion
requests/day



6+ Million
apps created



150+
add-on services

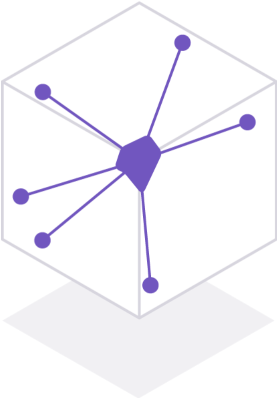
12 Factor app??

12 Factor

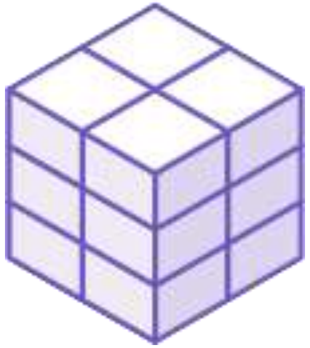
- Codebase: One codebase tracked in revision control, many deploys
- Dependencies: Explicitly declare and isolate dependencies
- Config: Store config in the environment
- Backing Services: Treat backing services as attached resources
- Build, release, run: Strictly separate build and run stages
- Processes: Execute the app as one or more stateless processes
- Port binding: Export services via port binding
- Concurrency: Scale out via the process model
- Disposability: Maximize robustness with fast startup and graceful shutdown
- Dev/prod parity: Keep development, staging, and production as similar as possible
- Logs: Treat logs as event streams
- Admin processes: Run admin/management tasks as one-off processes

How does Heroku work?

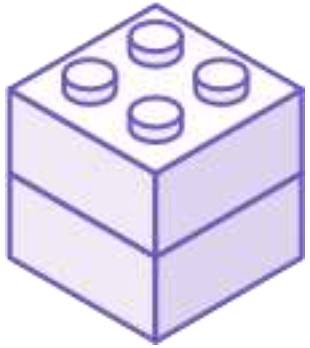
The Heroku Platform (as a Service)



Dynos

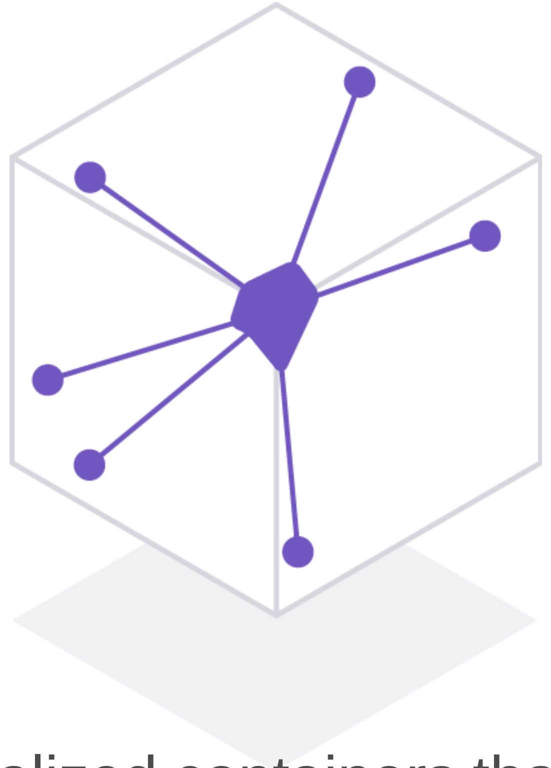


Data



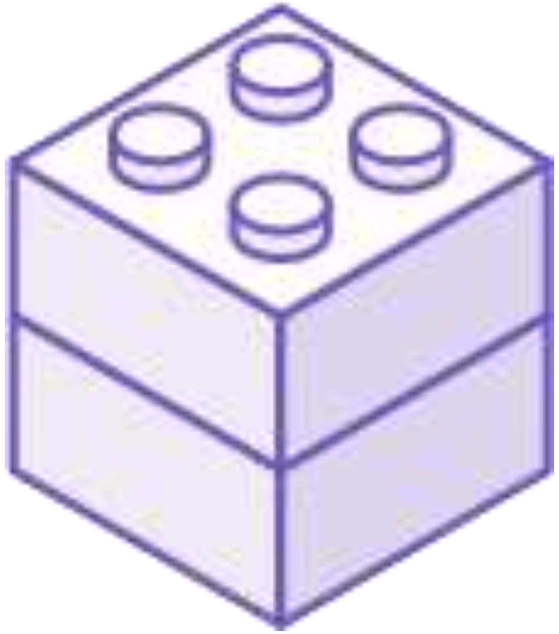
Add-ons

Dynos



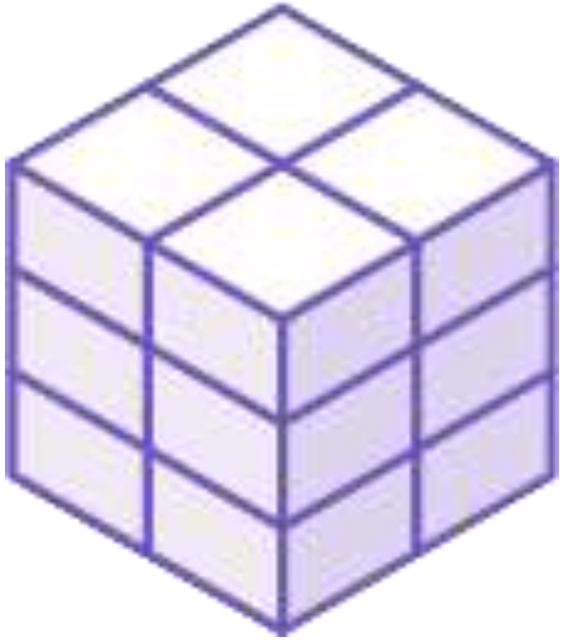
Virtualized containers that run application code

Add-ons



Tools, components and services
Some add-ons are shareable

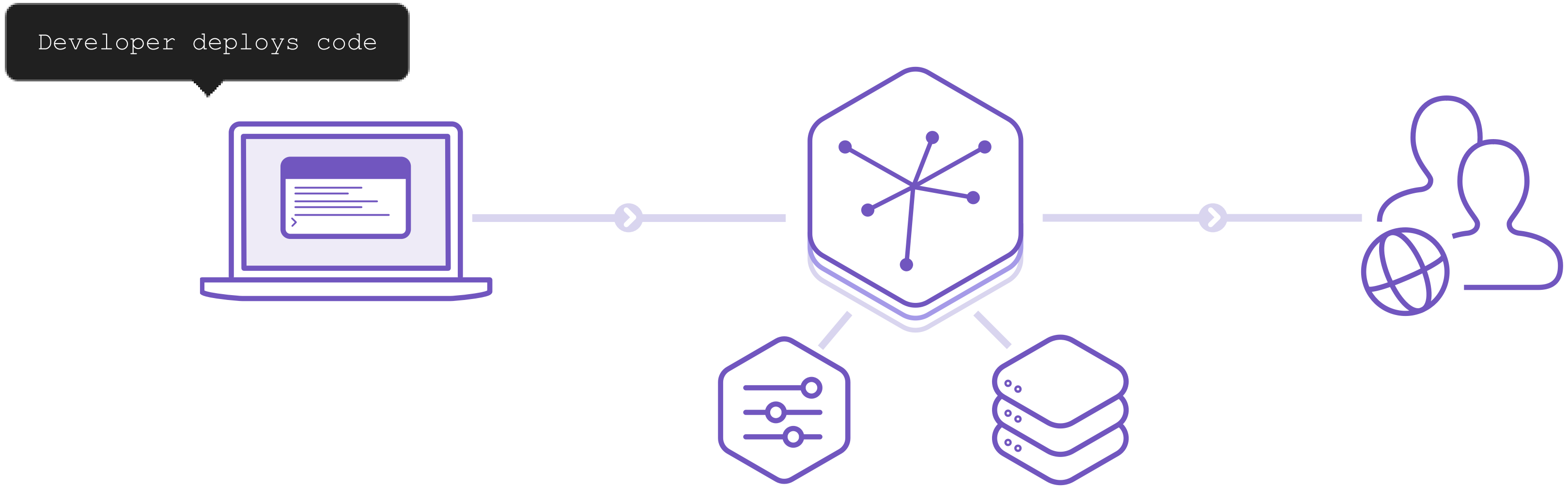
Database (and Data Store)



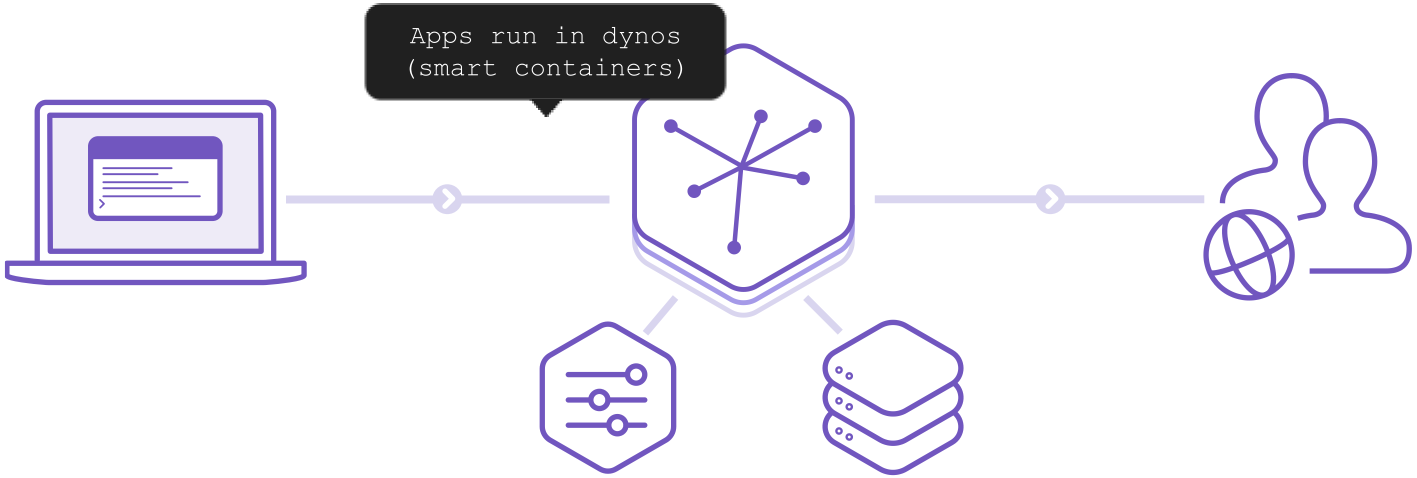
Fully managed Postgres, Redis and Kafka instances

Shareable among apps

How Heroku works

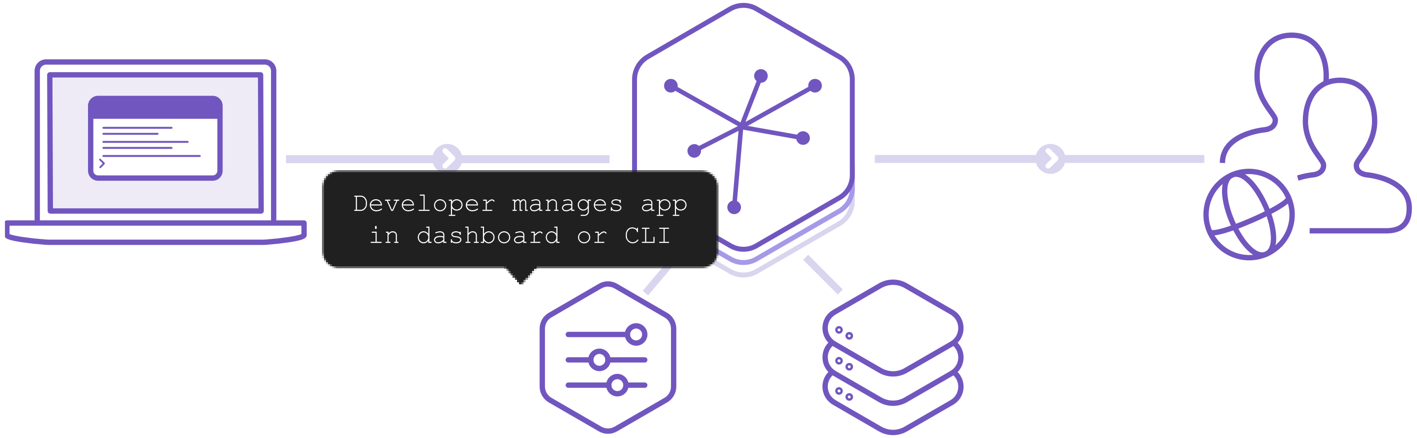


How Heroku works



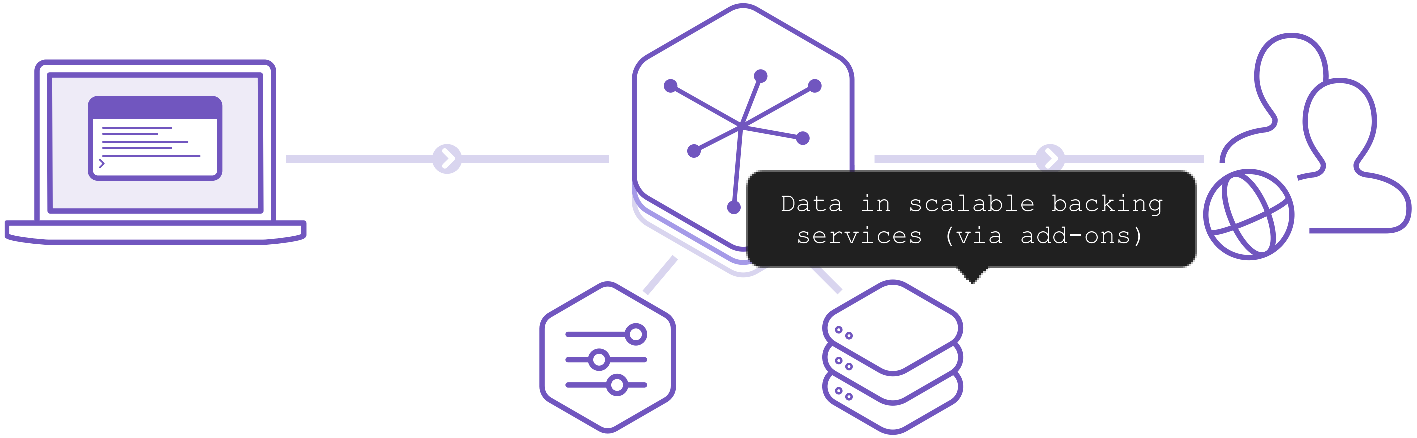
Apps run in dynos
(smart containers)

How Heroku works



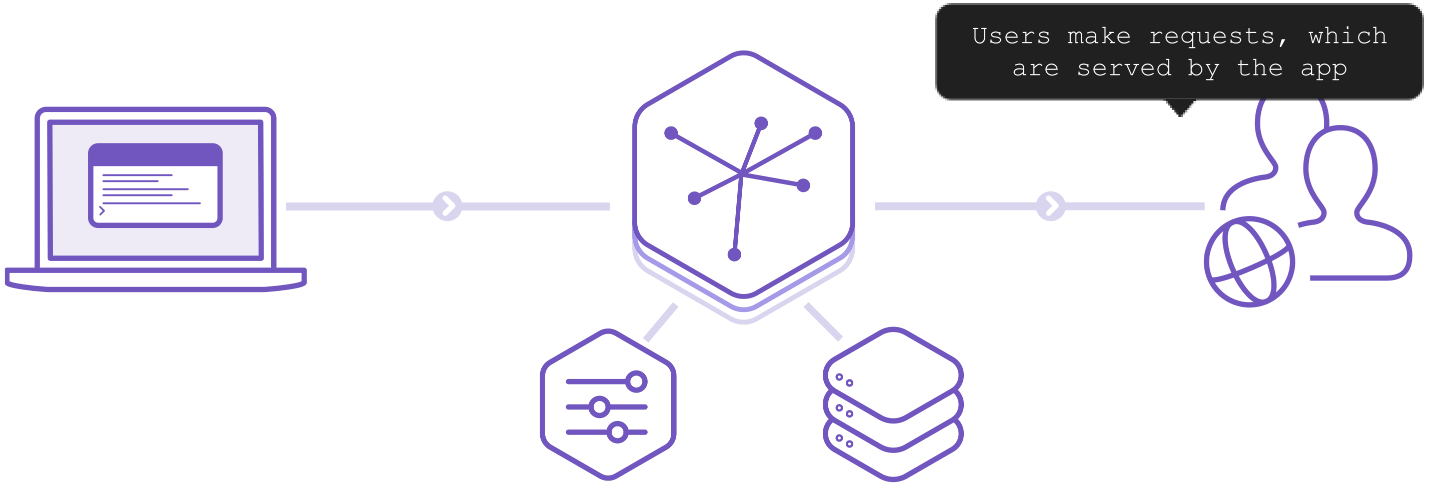
Developer manages app in dashboard or CLI

How Heroku works

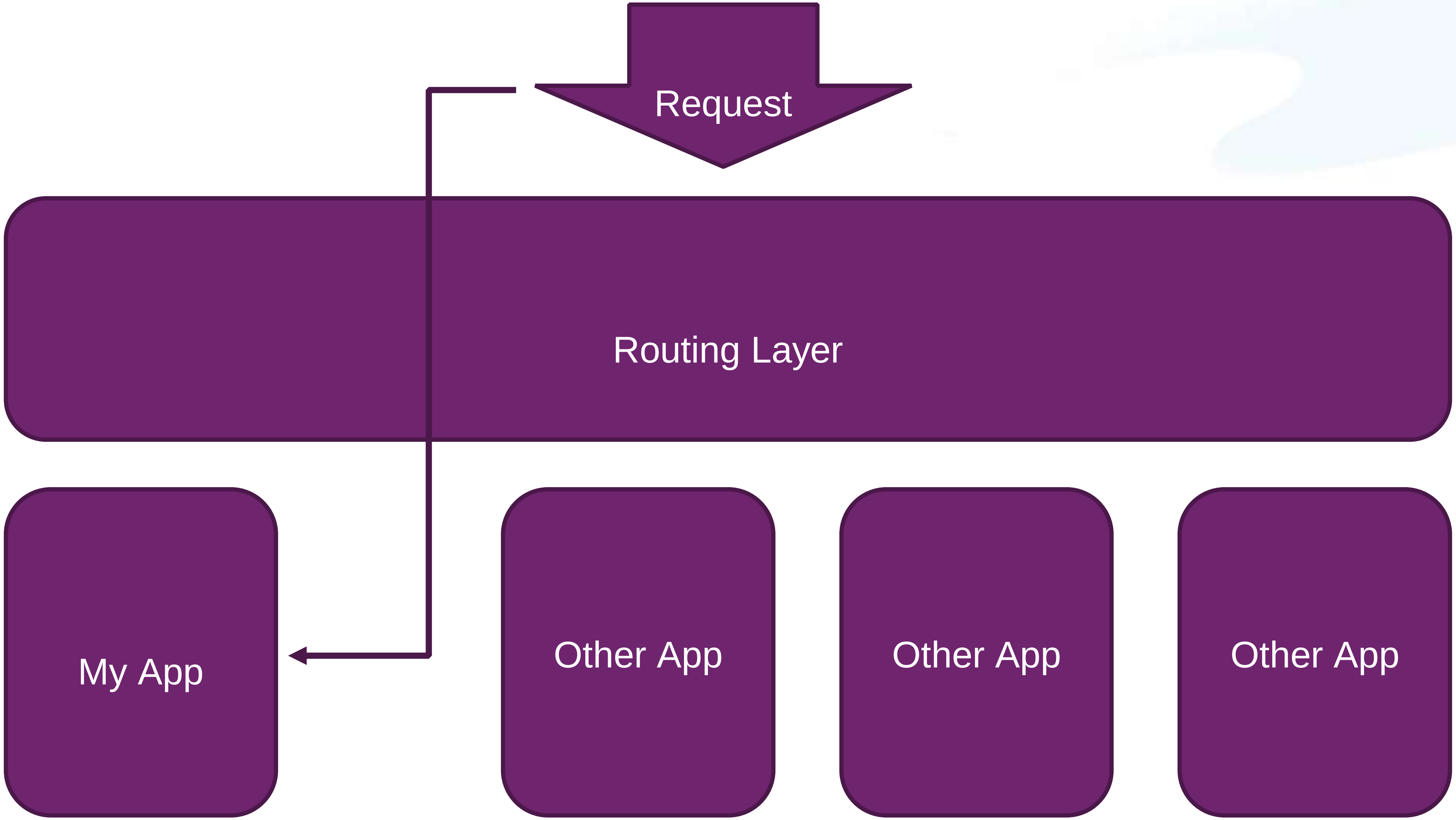


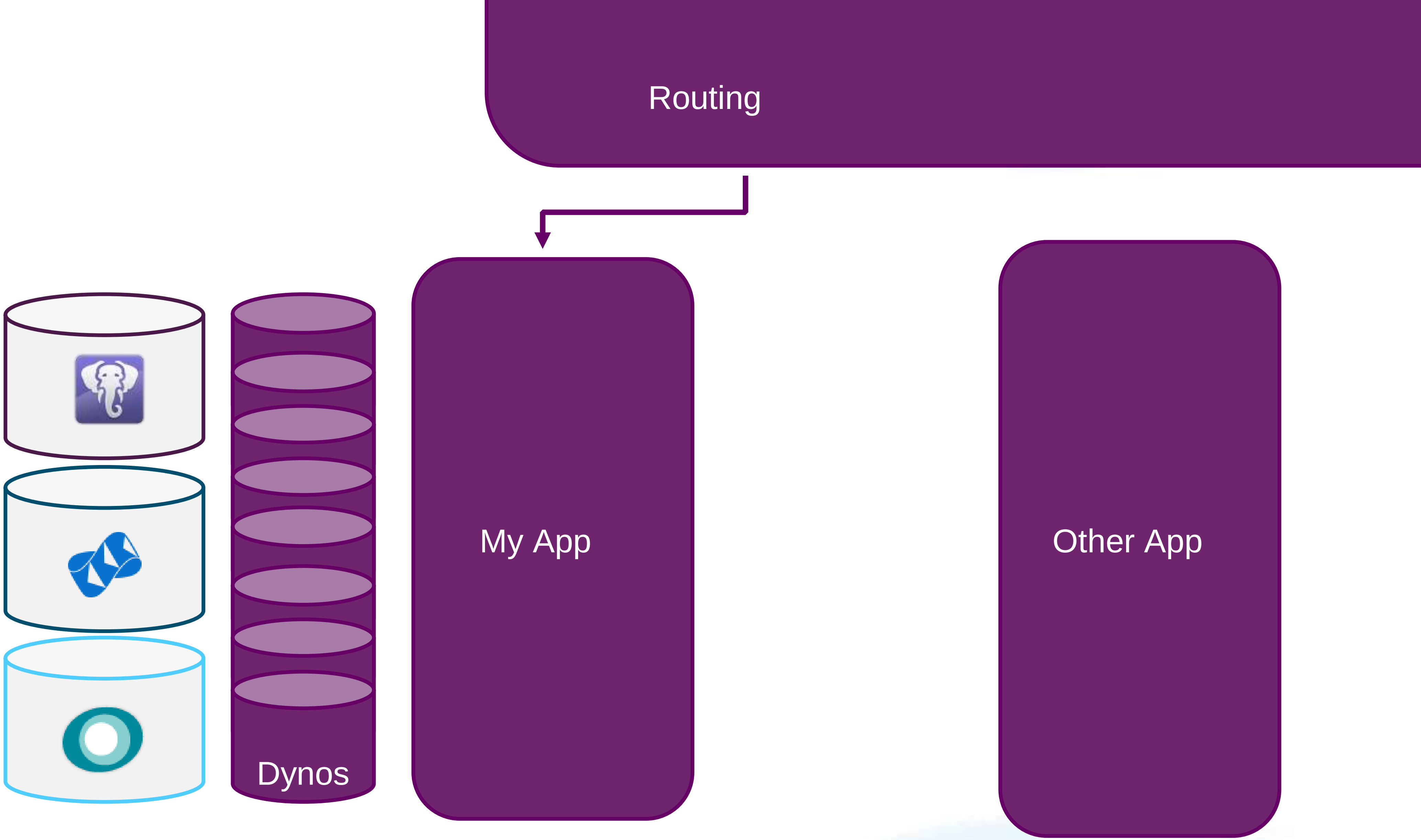
Data in scalable backing services (via add-ons)

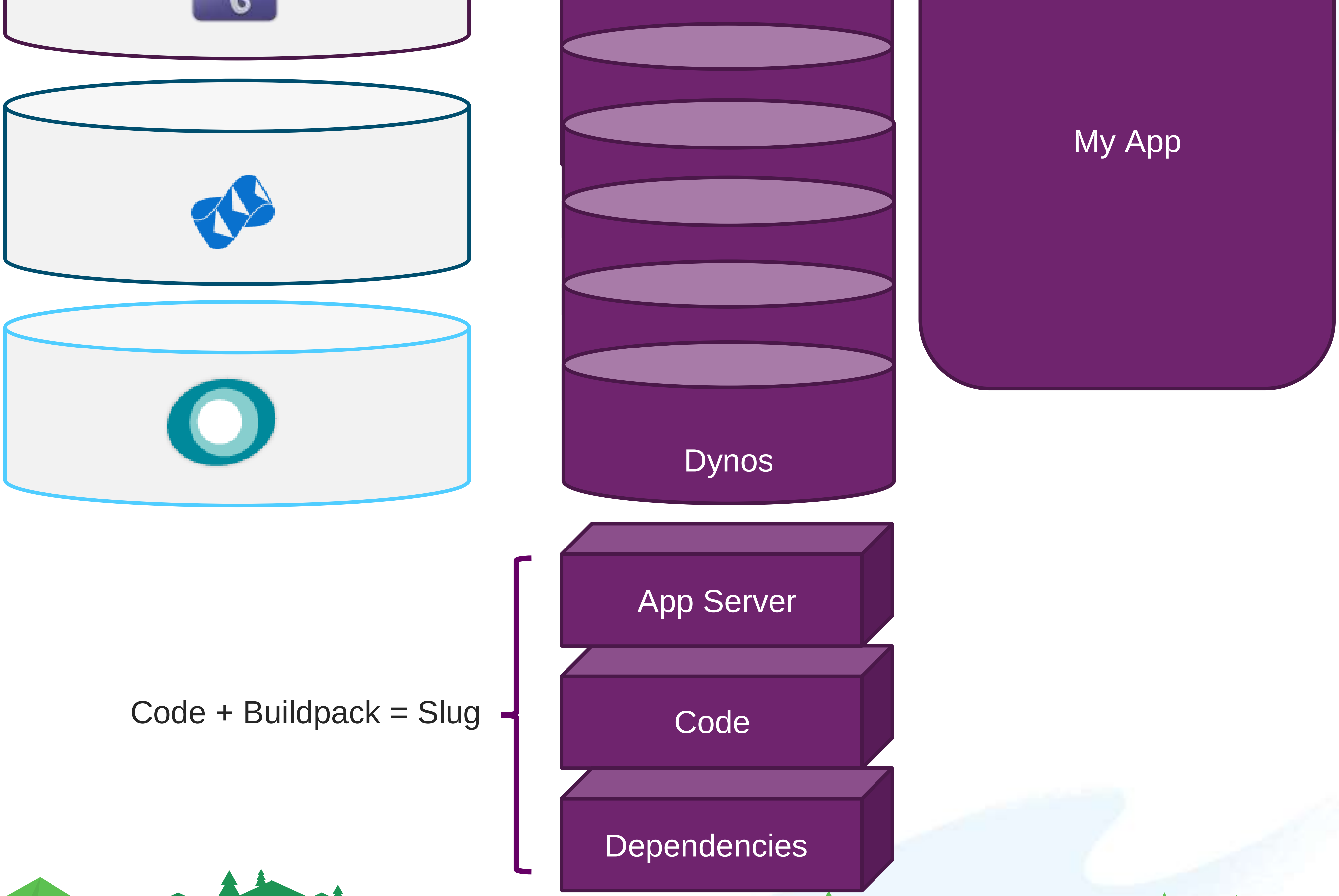
How Heroku works



Users make requests, which are served by the app


Request
Routing Layer
My App
Other App
Other App
Other App


Routing
My App
Other App
Dynos


My App
Dynos
App Server
Code
Dependencies
Code + Buildpack = Slug

Usersynchronous

AMSAT on Heroku

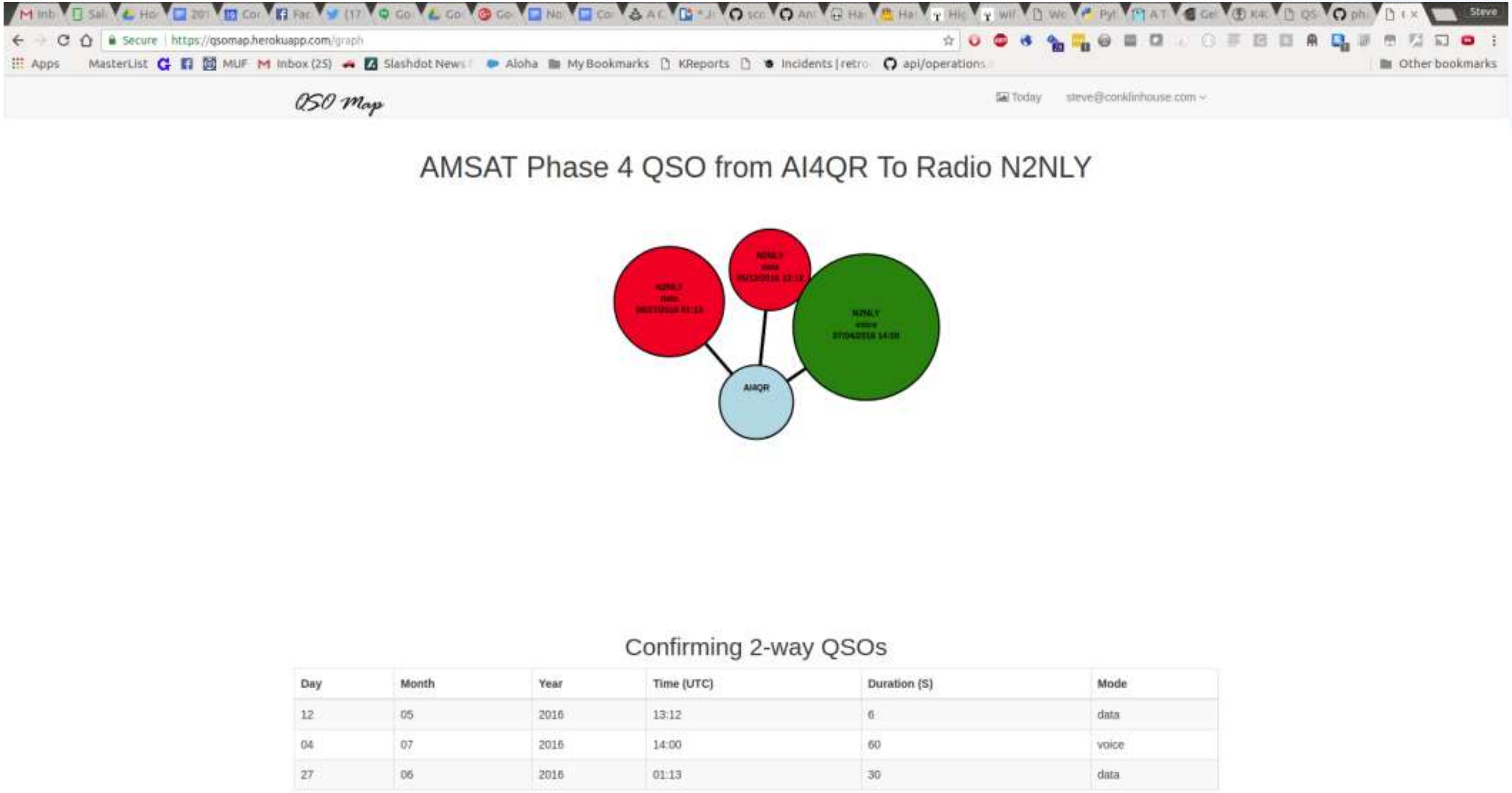
Usersynchronous is a QSO visualization app

An example of a cloud-based app for an AMSAT project

- It's currently just a shell
- It has user authentication
- There's one sample visualization in the app
- No actual logs are used yet
- The source code is in the phase4 github repo as "usersynchronous"

Currently available at https://qsomap.herokuapp.com/

Sample graph at https://qsomap.herokuapp.com/graph



AMSAT Phase 4 QSO from AI4QR To Radio N2NLY

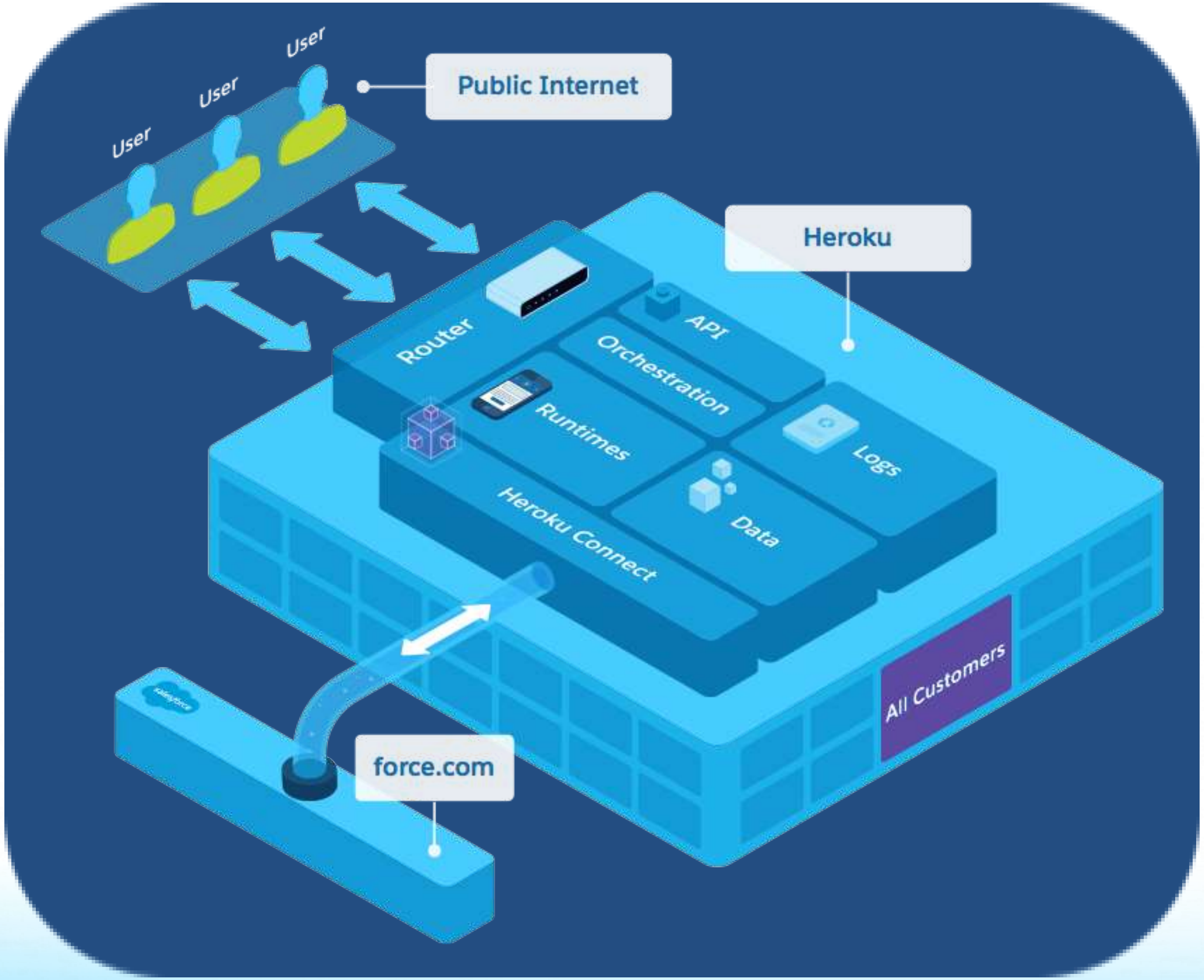
Confirming 2-way QSOs

Day	Month	Year	Time (UTC)	Duration (S)	Mode
12	05	2016	13:12	6	data
04	07	2016	14:00	60	voice
27	06	2016	01:13	30	data

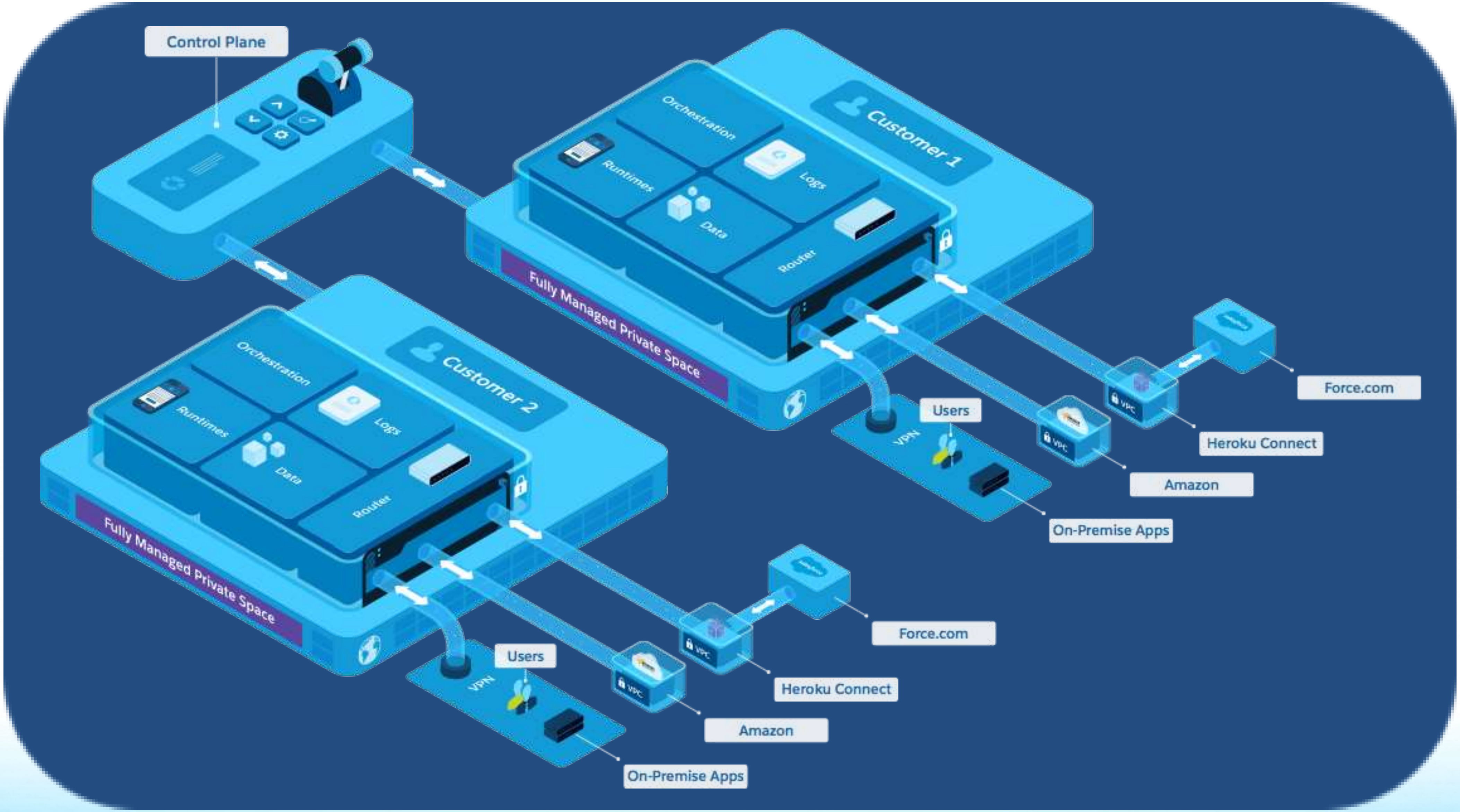
Questions?

Advanced Features

Heroku Today: Cedar

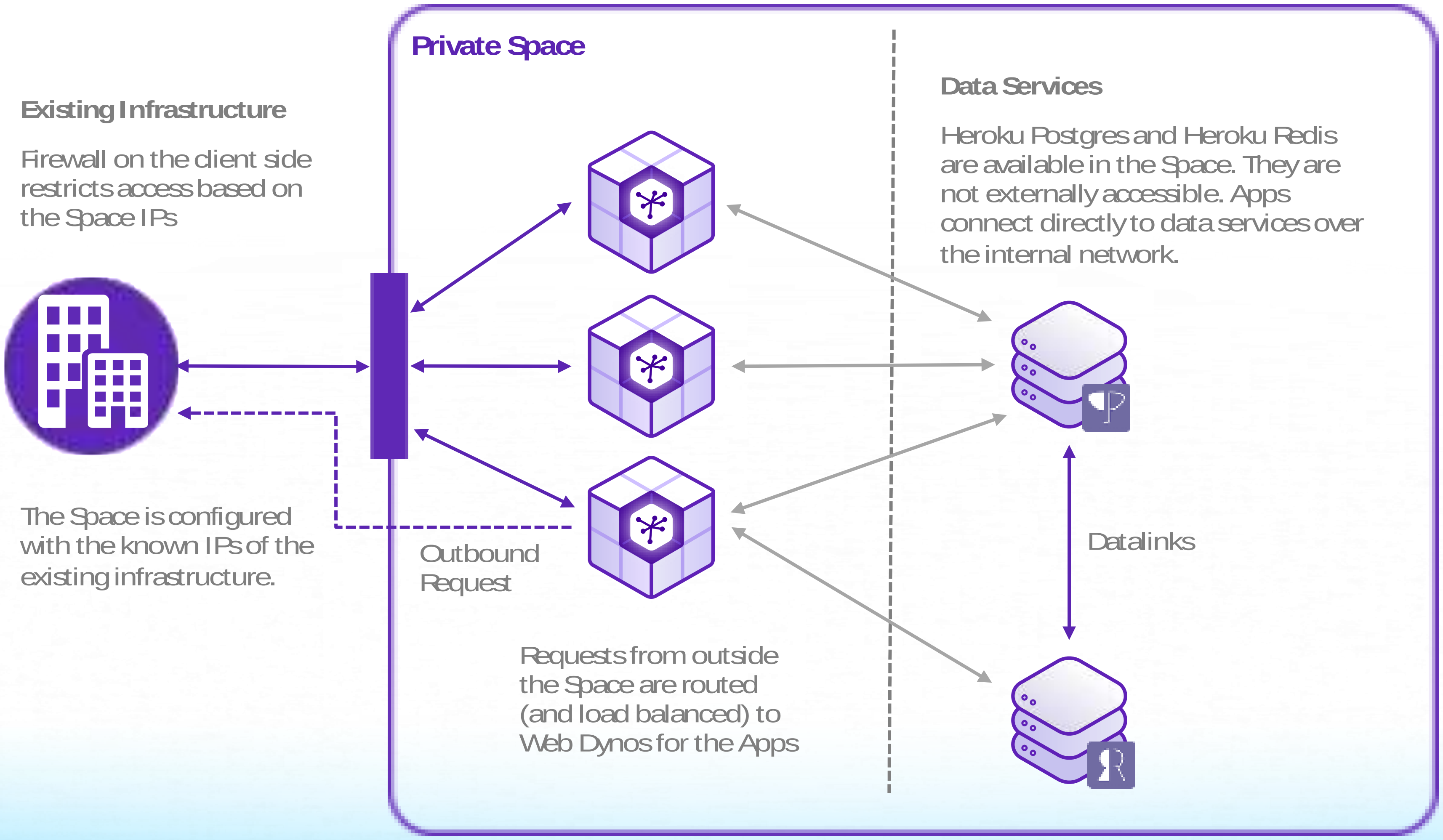


Heroku Private Spaces



Private Spaces Architecture

Trusted Inbound Network and Stable Outbound IPs



Existing Infrastructure

Firewall on the client side restricts access based on the Space IPs

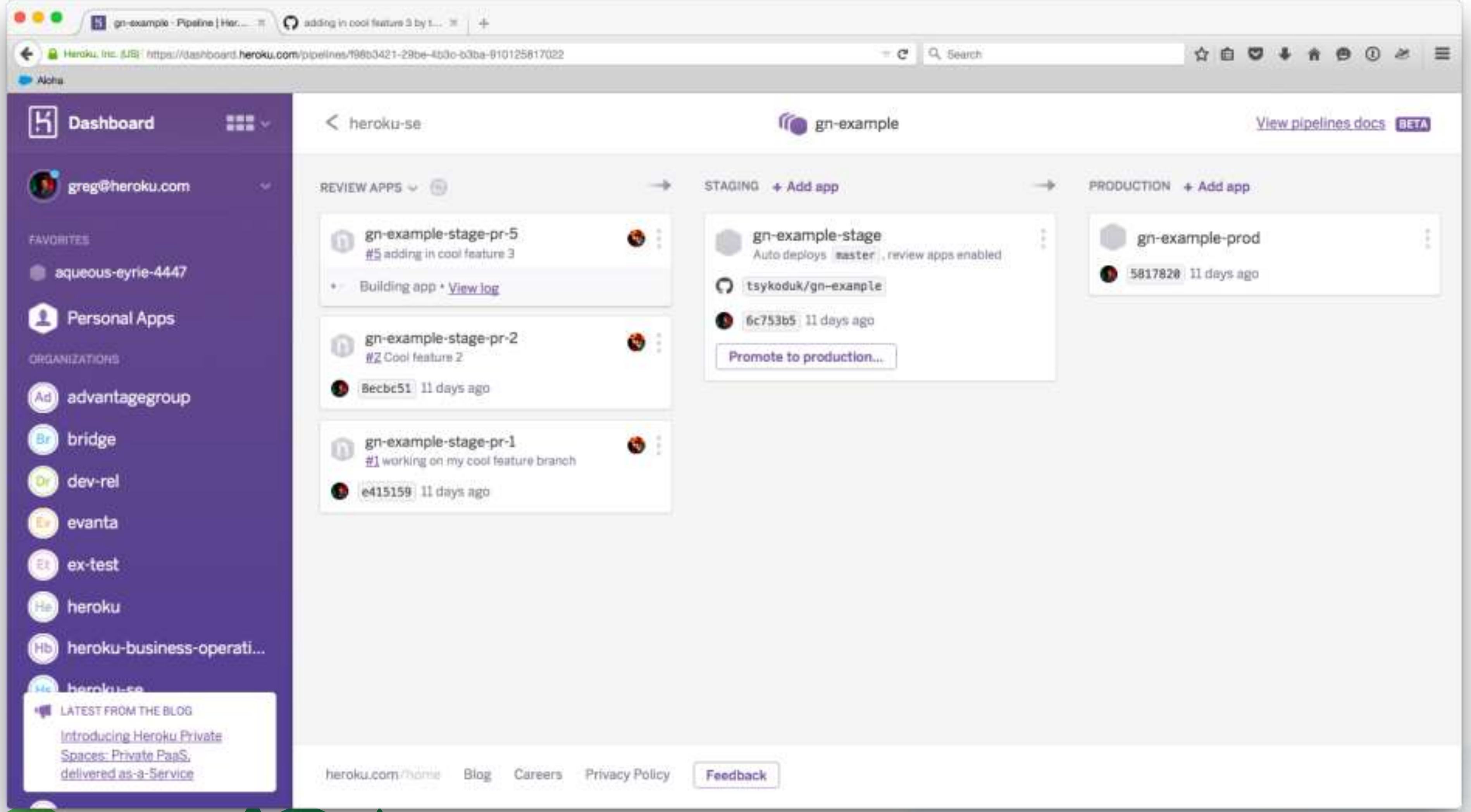
The Space is configured with the known IPs of the existing infrastructure.

Requests from outside the Space are routed (and load balanced) to Web Dynos for the Apps

Data Services

Heroku Postgres and Heroku Redis are available in the Space. They are not externally accessible. Apps connect directly to data services over the internal network.

Heroku Flow : Manage a complete Continuous Integration/Delivery workflow



gn-example · Pipeline | Her...

adding in cool feature 3 by t...

Heroku, Inc. (US) https://dashboard.heroku.com/pipelines/f98b3421-29be-4b3c-b3ba-910125817022

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Personal Apps

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heroku

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heroku-se

LATEST FROM THE BLOG

Introducing Heroku Private Spaces: Private PaaS, delivered as-a-Service

heroku-se

gn-example

View pipelines docs BETA

REVIEW APPS

gn-example-stage-pr-5

#5 adding in cool feature 3

Building app • View log

gn-example-stage-pr-2

#2 Cool feature 2

8ecbc51 11 days ago

gn-example-stage-pr-1

#1 working on my cool feature branch

e415159 11 days ago

STAGING + Add app

gn-example-stage

Auto deploys `master` , review apps enabled

`tsykoduk/gn-example`

6c753b5 11 days ago

Promote to production...

PRODUCTION + Add app

gn-example-prod

5817820 11 days ago

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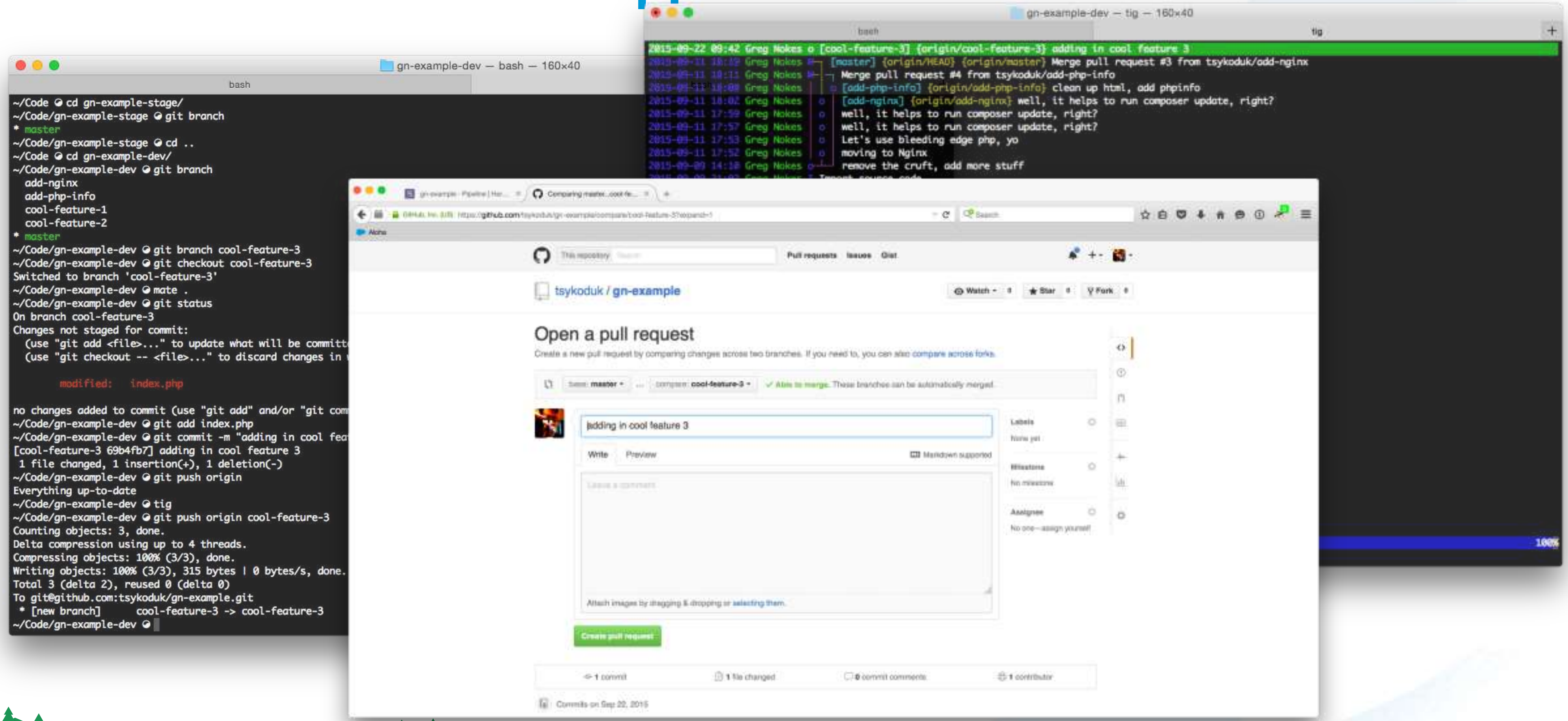
Heroku Flow: Review Apps



```
~/Code ◕ cd gn-example-stage/
~/Code/gn-example-stage ◕ git branch
* master
~/Code/gn-example-stage ◕ cd ..
~/Code ◕ cd gn-example-dev/
~/Code/gn-example-dev ◕ git branch
  add-nginx
  add-php-info
  cool-feature-1
  cool-feature-2
* master
~/Code/gn-example-dev ◕ git branch cool-feature-3
~/Code/gn-example-dev ◕ git checkout cool-feature-3
Switched to branch 'cool-feature-3'
~/Code/gn-example-dev ◕ mate .
~/Code/gn-example-dev ◕ git status
On branch cool-feature-3
Changes not staged for commit:
  (use "git add <file>..." to update what will be committ
  (use "git checkout -- <file>..." to discard changes in 

        modified:   index.php

no changes added to commit (use "git add" and/or "git com
~/Code/gn-example-dev ◕ git add index.php
~/Code/gn-example-dev ◕ git commit -m "adding in cool fea
[cool-feature-3 69b4fb7] adding in cool feature 3
 1 file changed, 1 insertion(+), 1 deletion(-)
~/Code/gn-example-dev ◕ git push origin
Everything up-to-date
~/Code/gn-example-dev ◕ tig
~/Code/gn-example-dev ◕ git push origin cool-feature-3
Counting objects: 3, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 315 bytes | 0 bytes/s, done.
Total 3 (delta 2), reused 0 (delta 0)
To git@github.com:tsykoduk/gn-example.git
 * [new branch]      cool-feature-3 -> cool-feature-3
~/Code/gn-example-dev ◕ 
```

```
2015-09-22 09:42 Greg Nokes o [cool-feature-3] {origin/cool-feature-3} adding in cool feature 3
2015-09-11 18:19 Greg Nokes M─┐ [master] {origin/HEAD} {origin/master} Merge pull request #3 from tsykoduk/add-nginx
2015-09-11 18:11 Greg Nokes M─│─┐ Merge pull request #4 from tsykoduk/add-php-info
2015-09-11 18:08 Greg Nokes │ │ o [add-php-info] {origin/add-php-info} clean up html, add phpinfo
2015-09-11 18:02 Greg Nokes │ o │ [add-nginx] {origin/add-nginx} well, it helps to run composer update, right?
2015-09-11 17:59 Greg Nokes │ o │ well, it helps to run composer update, right?
2015-09-11 17:57 Greg Nokes │ o │ well, it helps to run composer update, right?
2015-09-11 17:53 Greg Nokes │ o │ Let's use bleeding edge php, yo
2015-09-11 17:52 Greg Nokes │ o │ moving to Nginx
2015-09-09 14:18 Greg Nokes o─┘─┘ remove the cruft, add more stuff
                                                                                                    100%
```

gn-example · Pipeline | Her...
Comparing master...cool-fe...
GitHub, Inc. (US) https://github.com/tsykoduk/gn-example/compare/cool-feature-3?expand=1
Search
Aloha
This repository
Search
Pull requests
Issues
Gist
tsykoduk / gn-example
Watch ▾ 0
★ Star 0
Fork 0

Open a pull request

Create a new pull request by comparing changes across two branches. If you need to, you can also compare across forks.

base: master ▾ ... compare: cool-feature-3 ▾ ✓ Able to merge. These branches can be automatically merged.

adding in cool feature 3

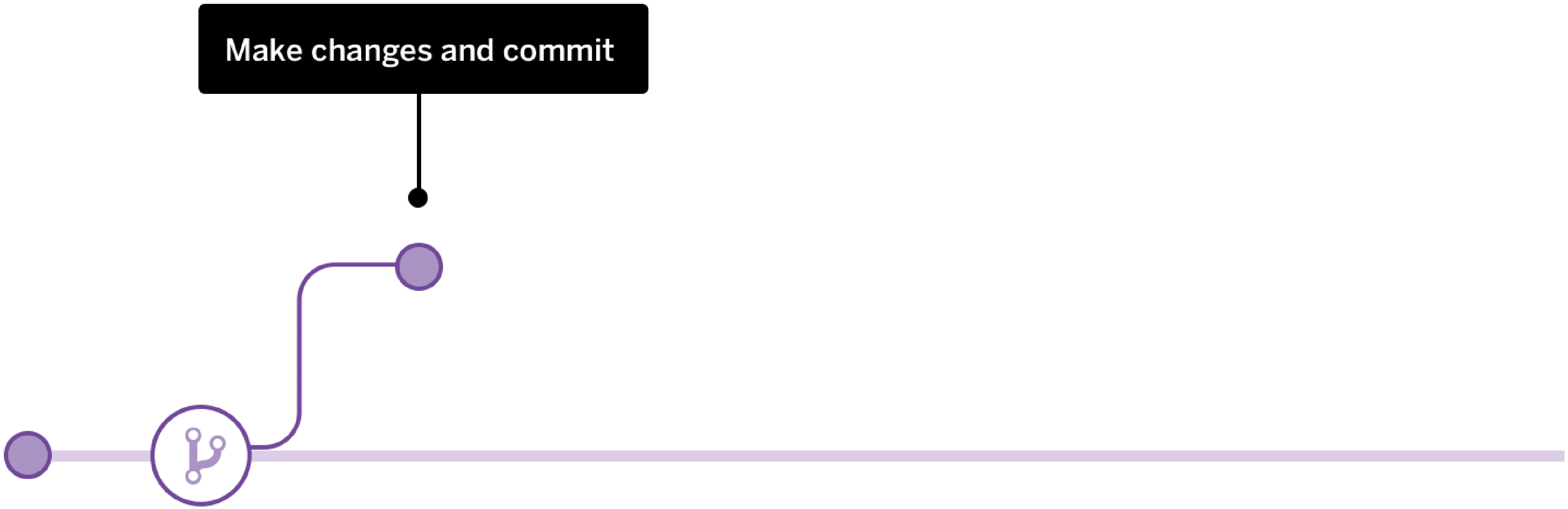
Attach images by dragging & dropping or selecting them.

1 commit · 1 file changed · 0 commit comments · 1 contributor

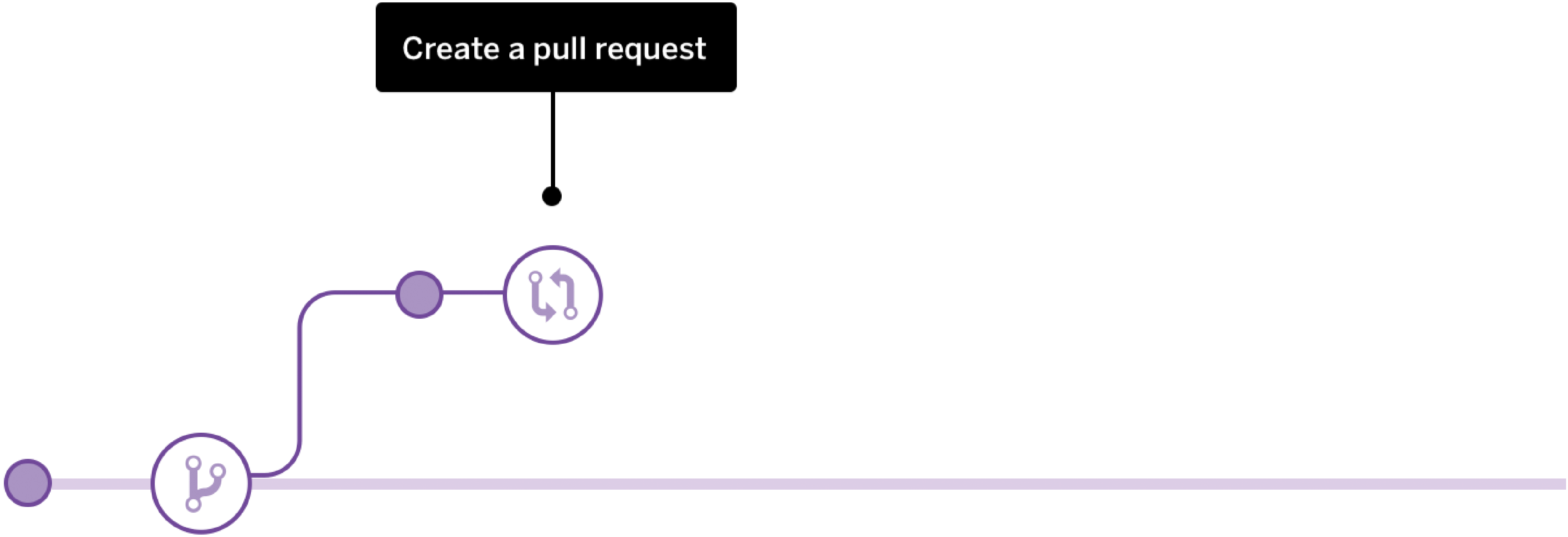
Commits on Sep 22, 2015

Tip of master

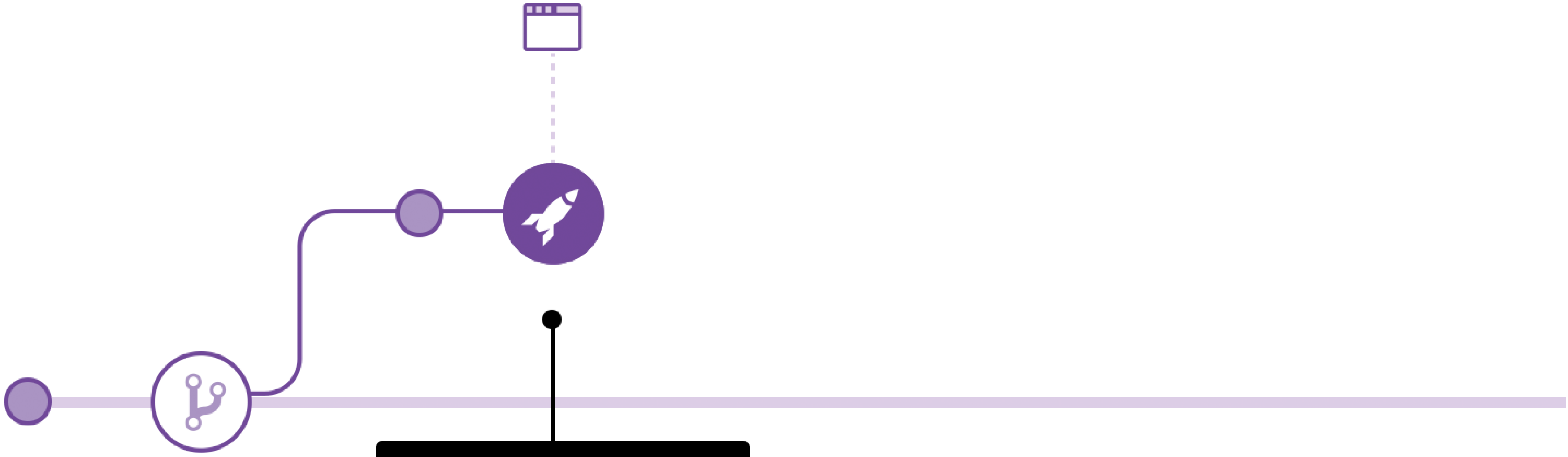
Create a branch



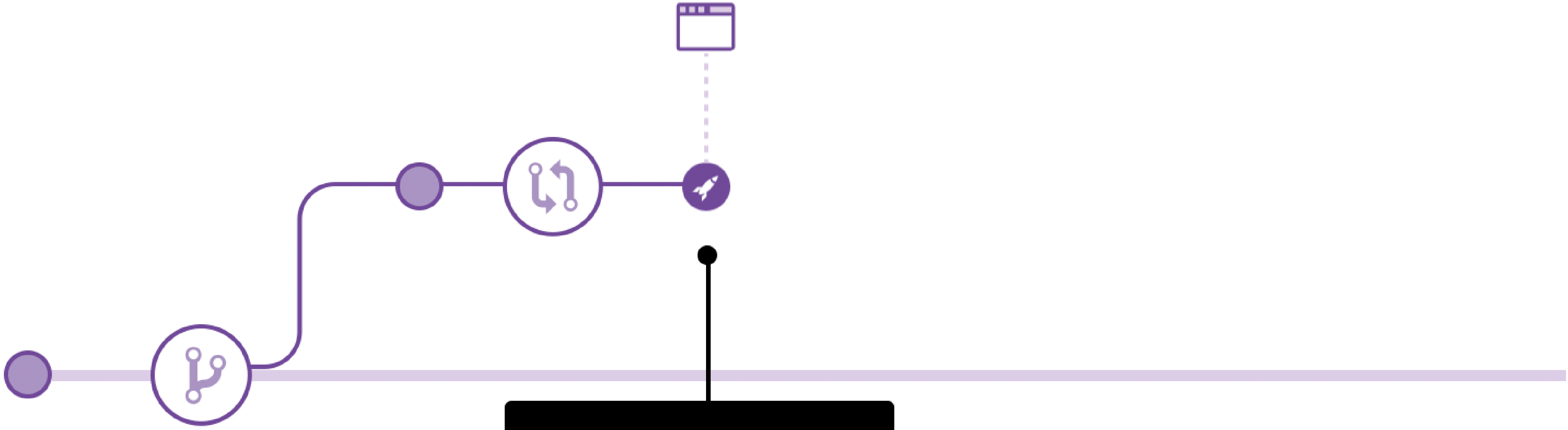
Make changes and commit



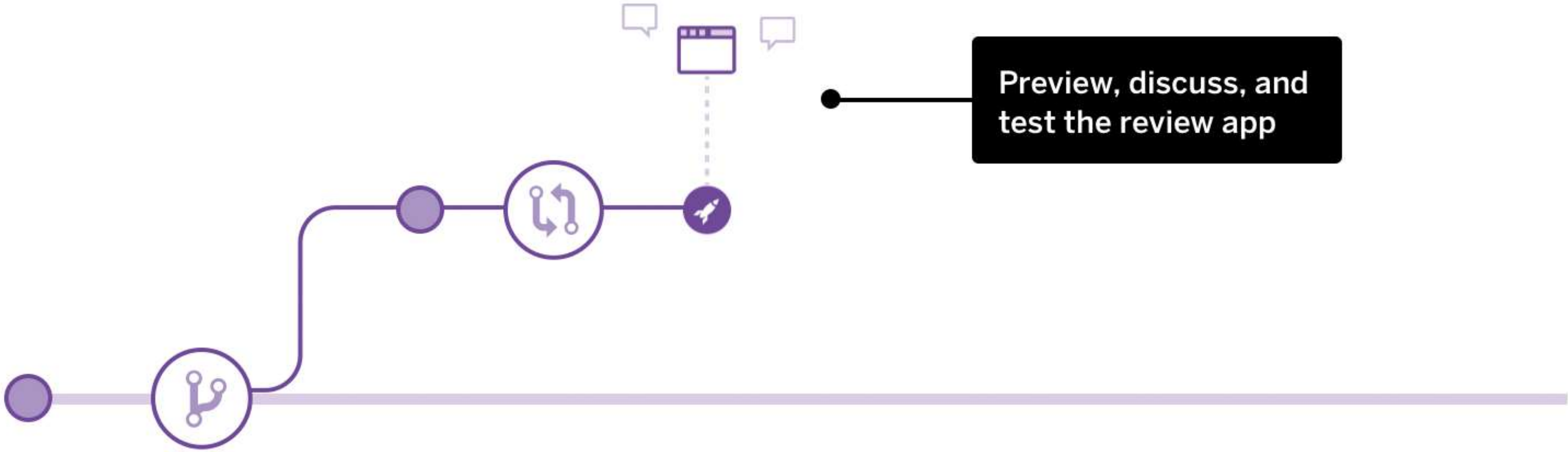
Create a pull request



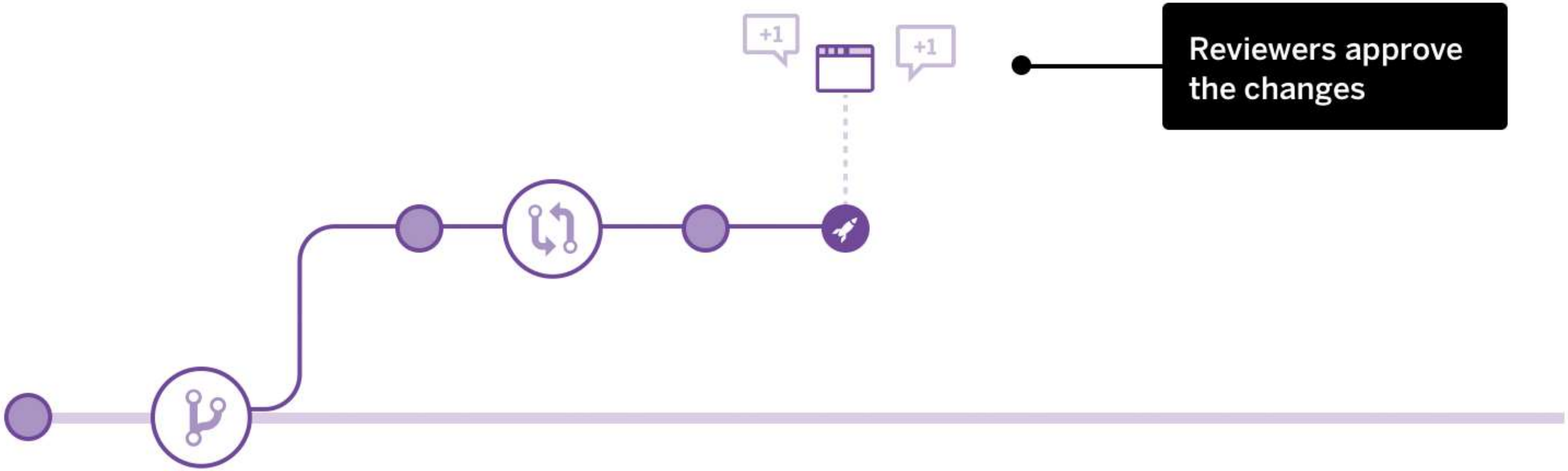
Review app is created



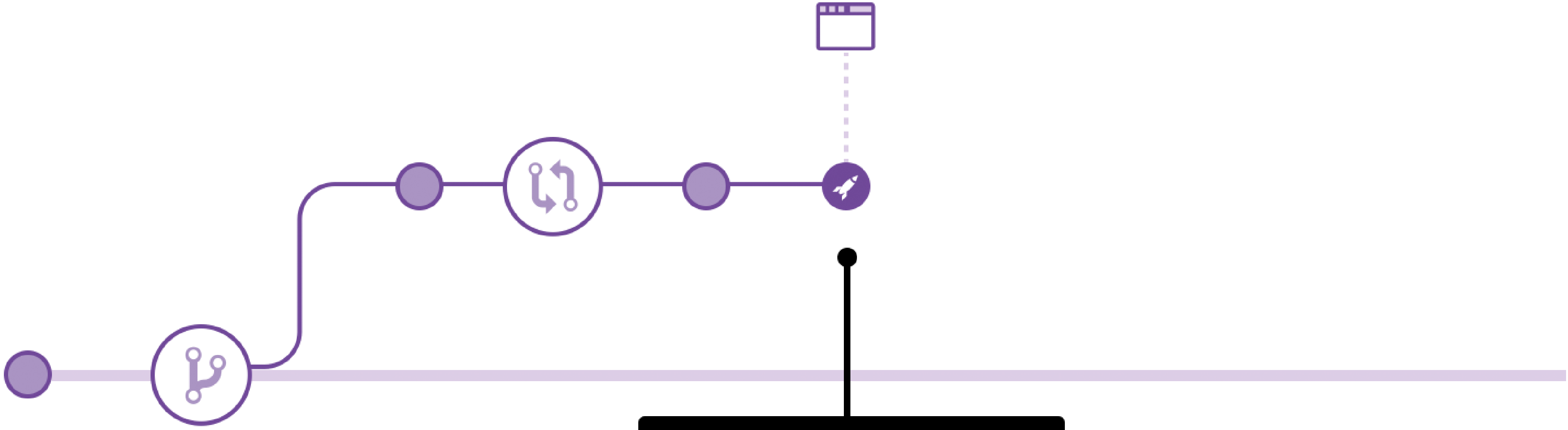
Each new change updates the review app



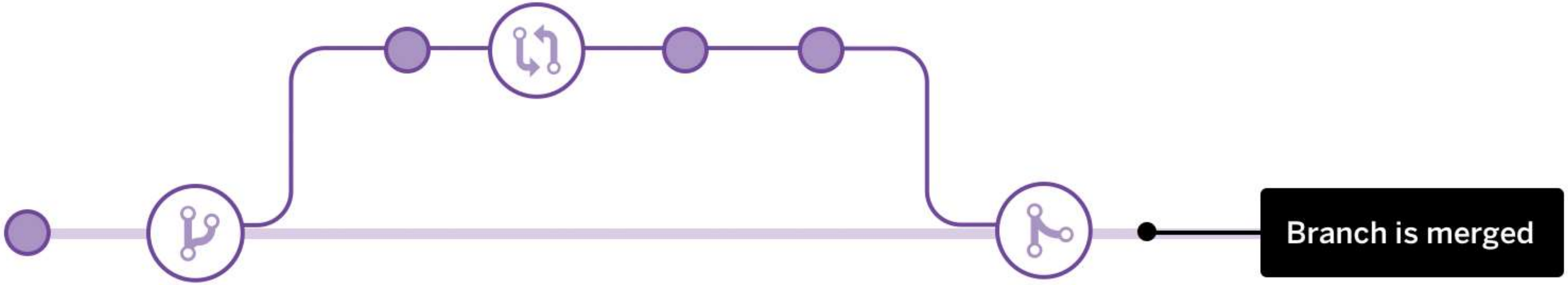
Preview, discuss, and test the review app



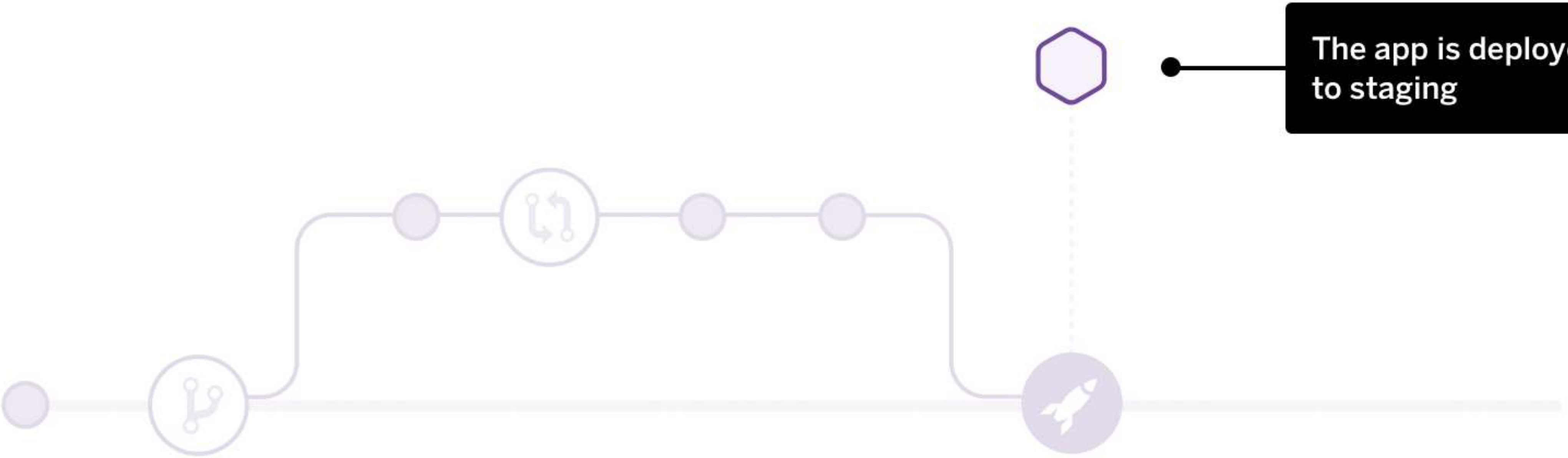
Reviewers approve the changes



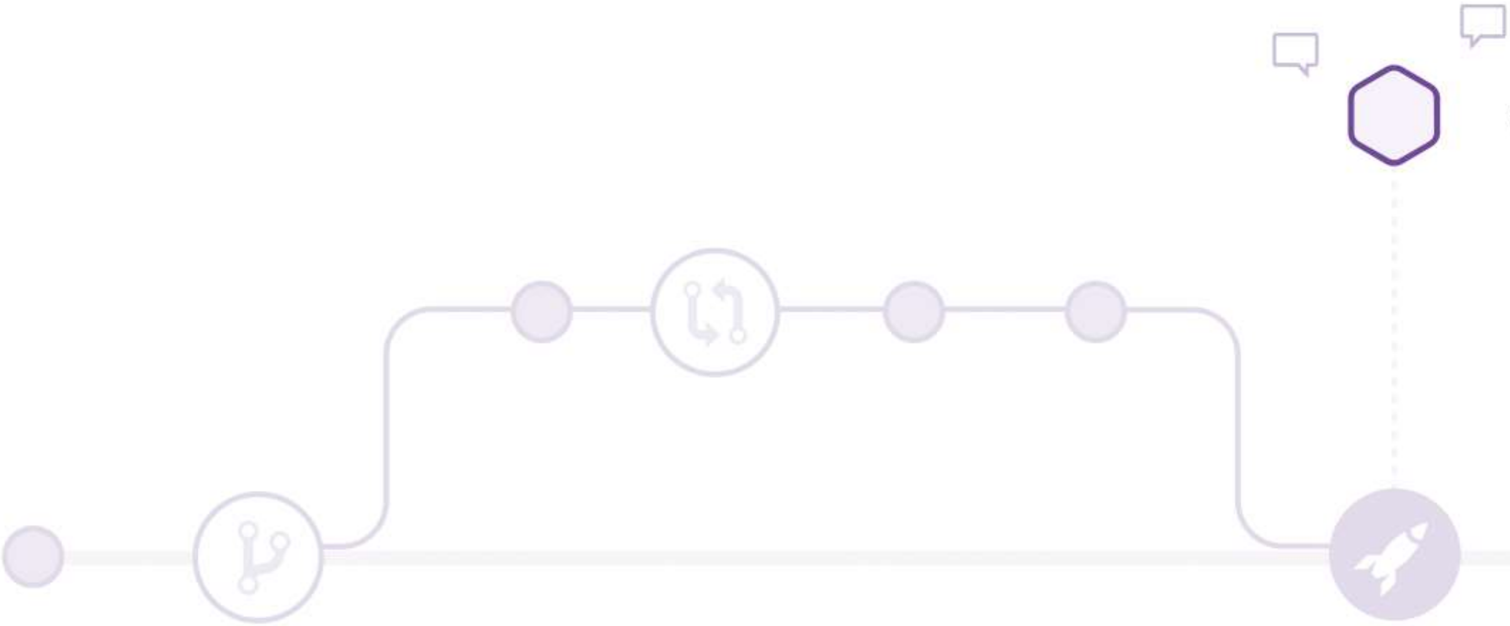
Branch is ready to merge



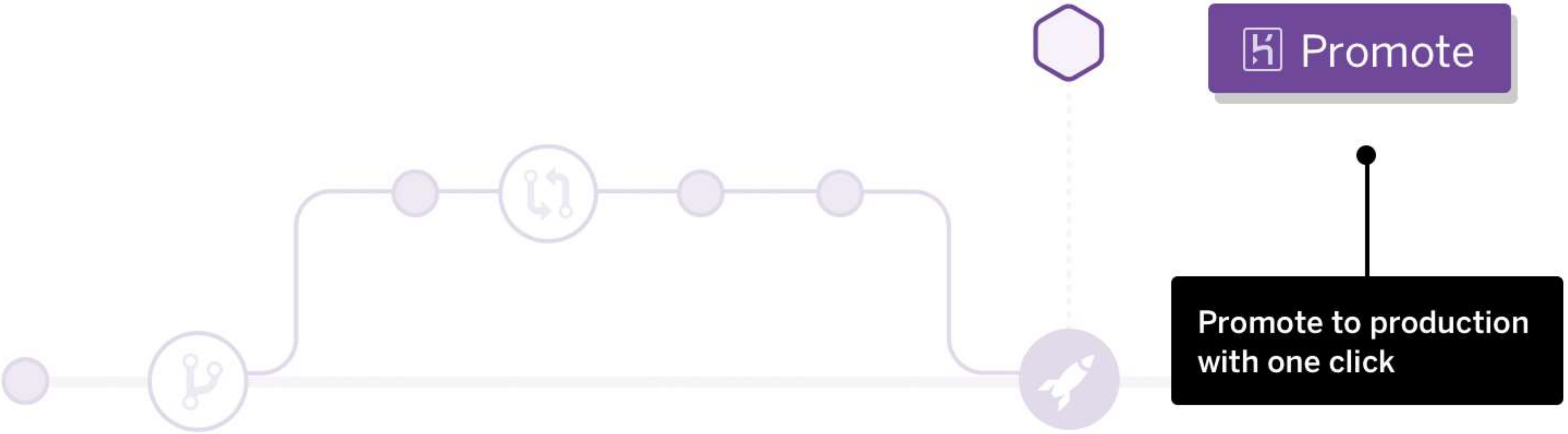
Branch is merged



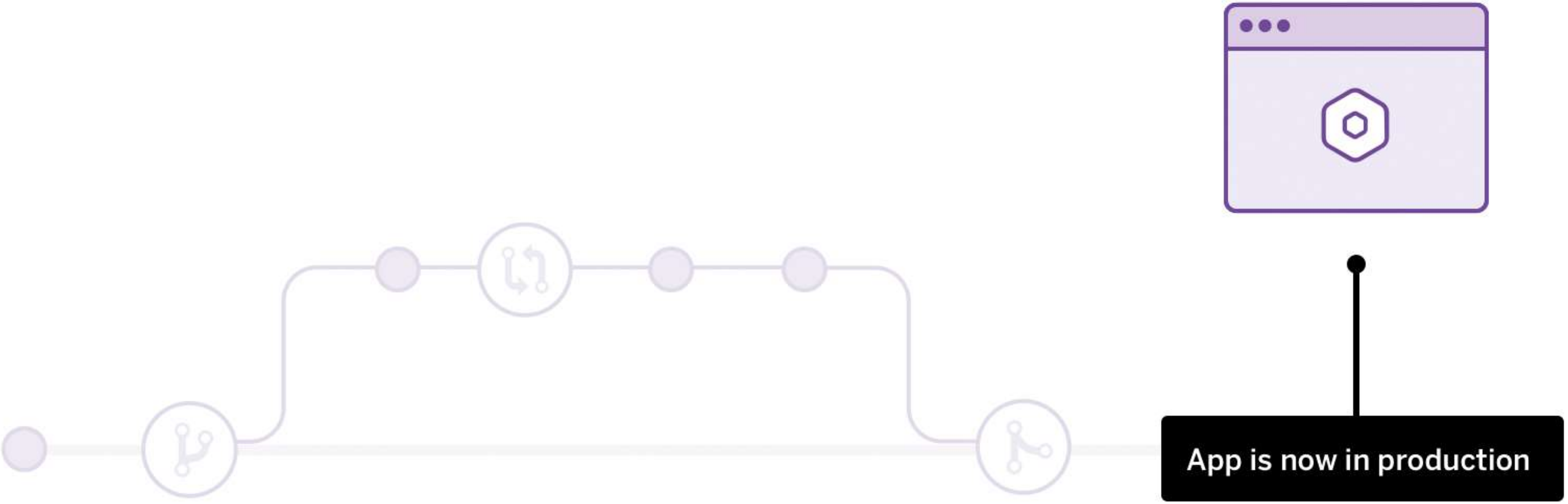
The app is deployed to staging



Review, discuss, and test the app

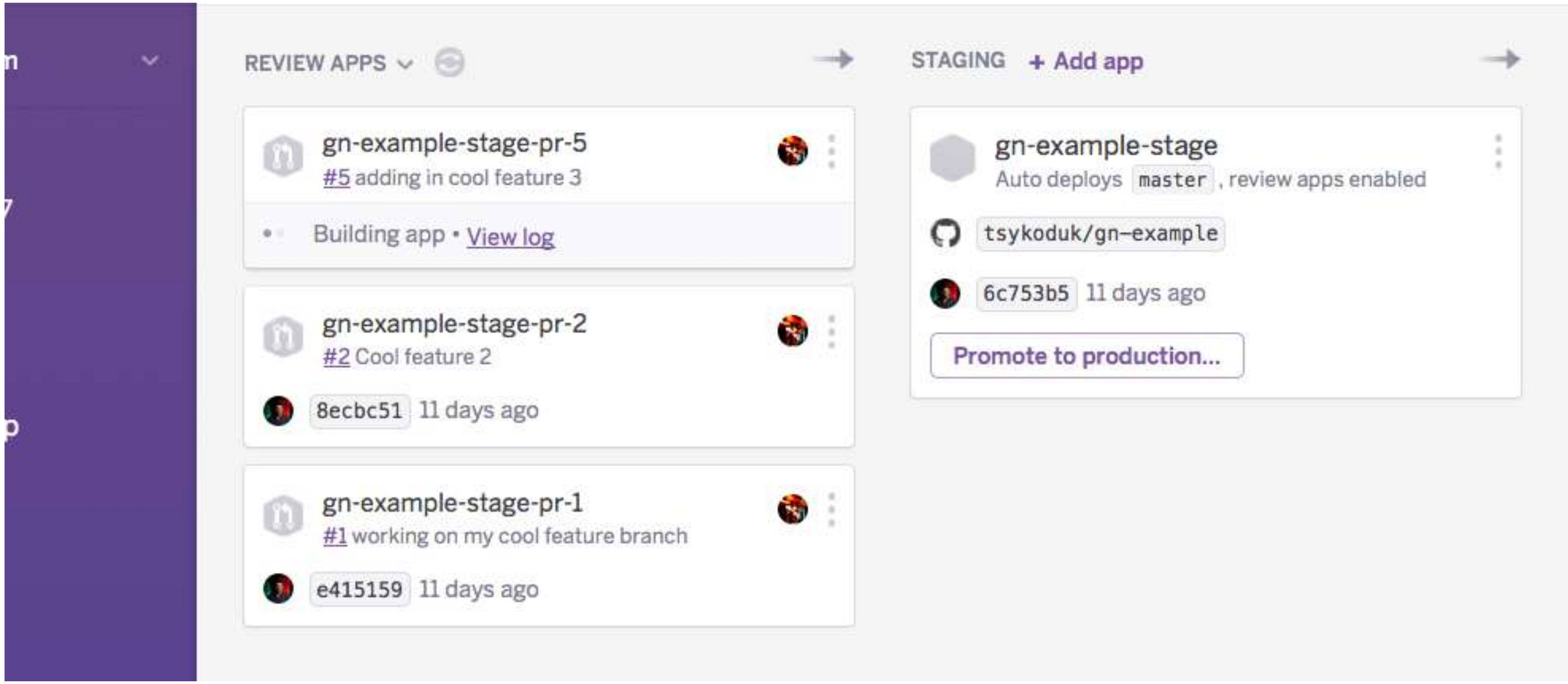


Promote to production with one click



App is now in production

Heroku Flow: Auto Deploy to Staging



REVIEW APPS

gn-example-stage-pr-5
#5 adding in cool feature 3
Building app • View log

gn-example-stage-pr-2
#2 Cool feature 2
8ecbc51 11 days ago

gn-example-stage-pr-1
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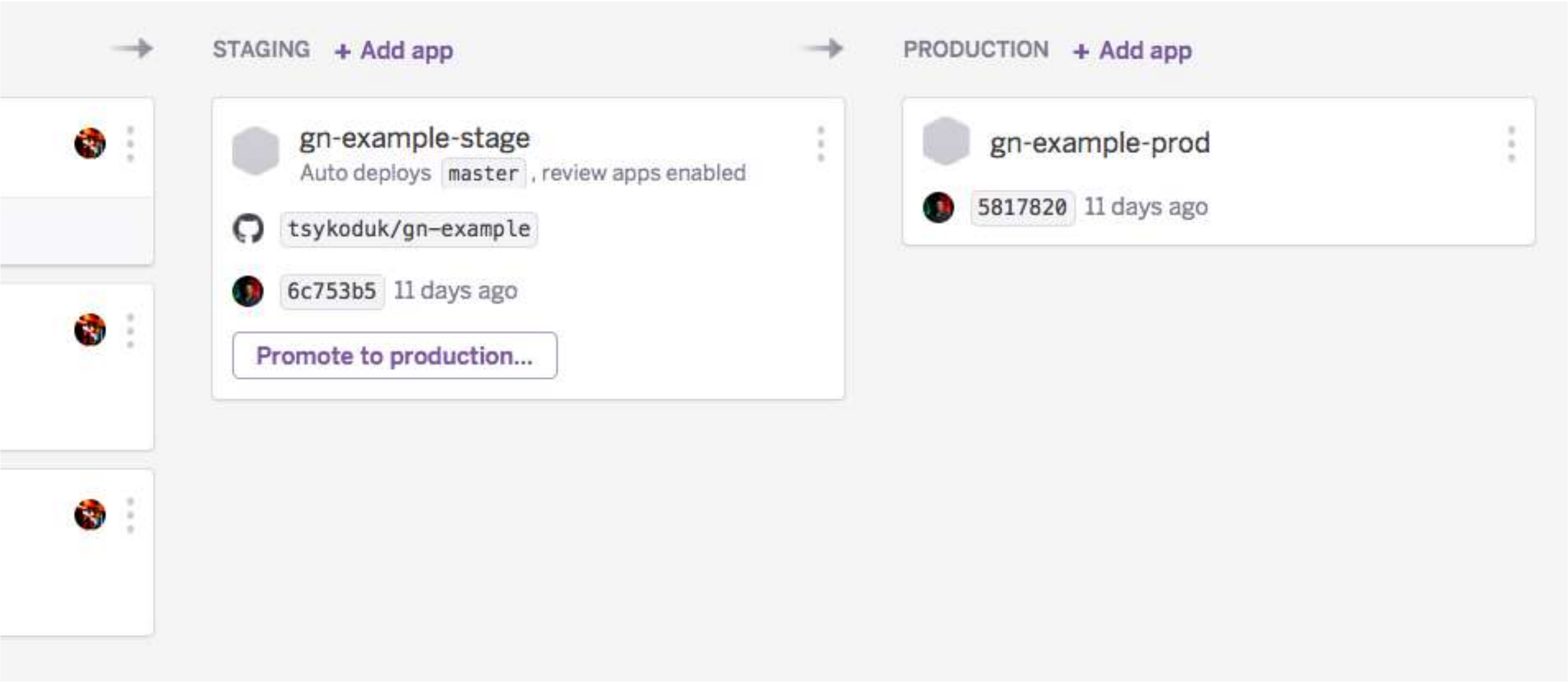
STAGING + Add app

gn-example-stage
Auto deploys `master` , review apps enabled
`tsykoduk/gn-example`
6c753b5 11 days ago

Promote to production...

Heroku Flow: Promote to Production

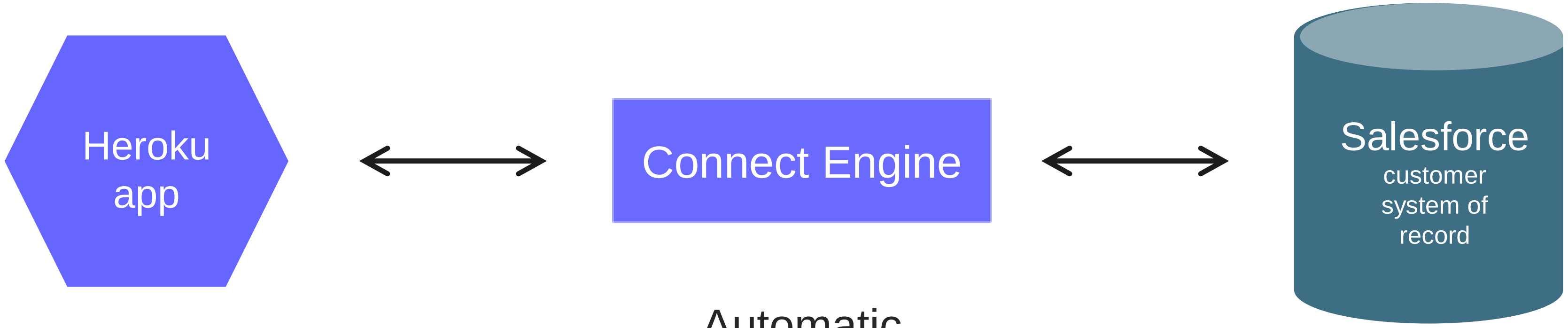


gn-example-stage
Auto deploys `master` , review apps enabled
`tsykoduk/gn-example`
`6c753b5` 11 days ago

gn-example-prod
`5817820` 11 days ago

Salesforce + Heroku

Connect your customer apps in a whole new way



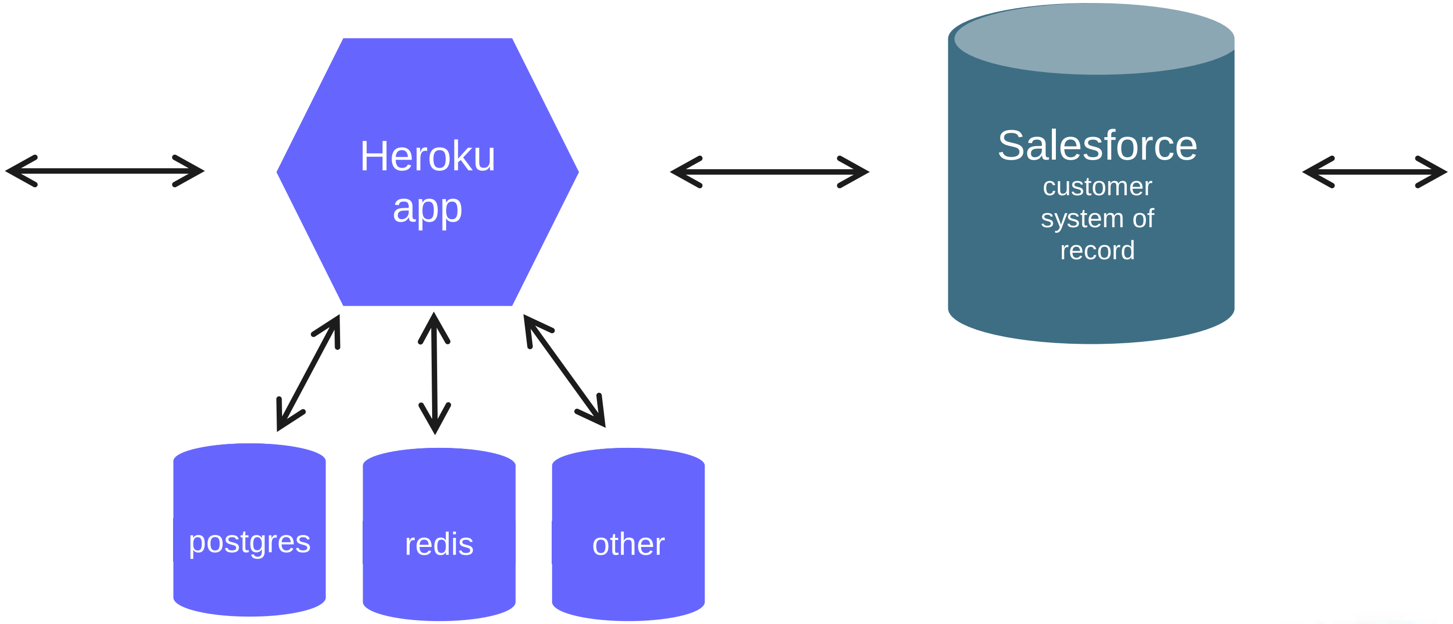
Automatic
Intelligent
Bi-directional
Secure

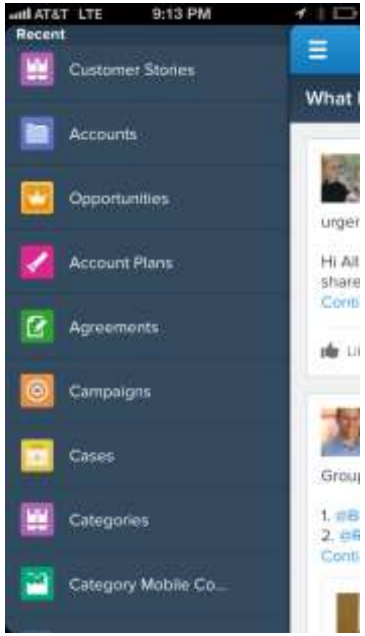
Salesforce + Heroku

Connect your customer apps in a whole new way

AUTOMATIC

Customer facing app

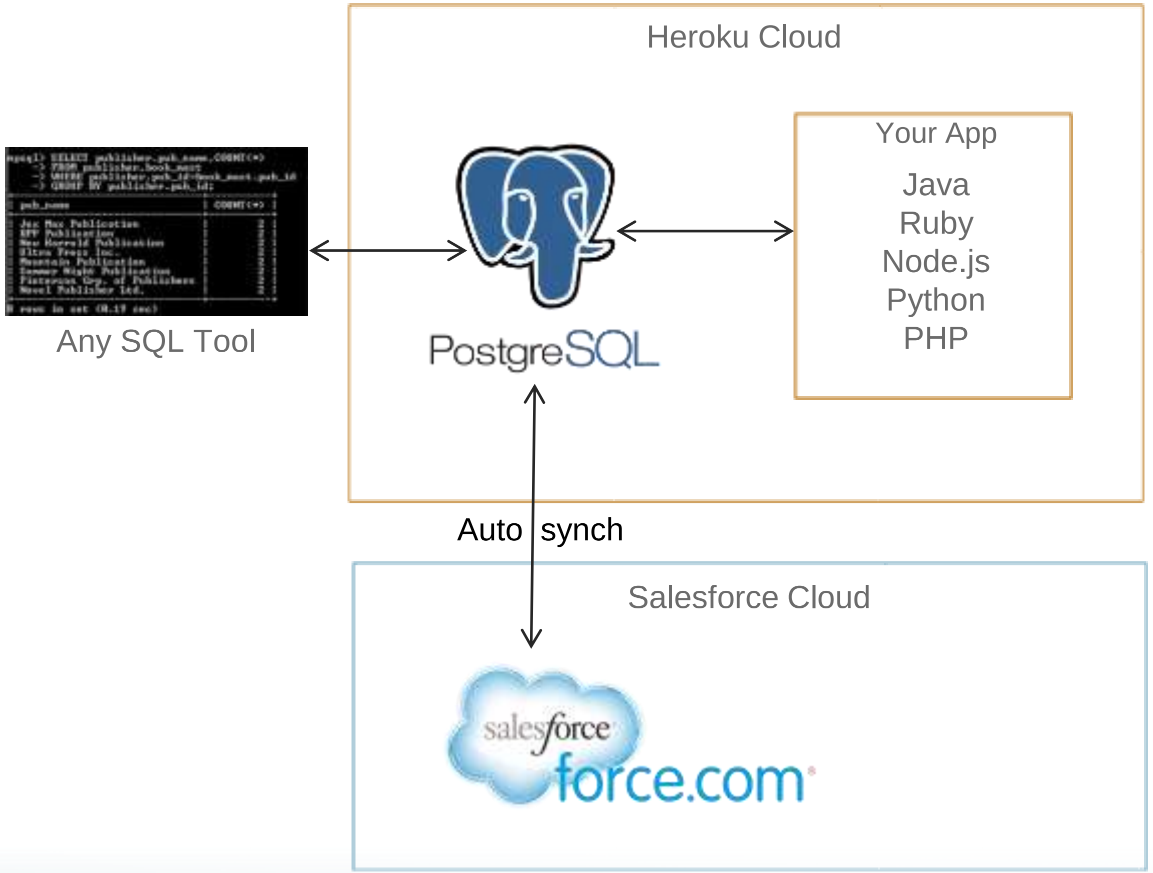




Business Apps

Heroku Connect Architecture

Benefits



```
mysql> SELECT publisher.pub_name,COUNT(*)
    -> FROM publisher,book_mast
    -> WHERE publisher.pub_id=book_mast.pub_id
    -> GROUP BY publisher.pub_id;
+------------------------------+----------+
| pub_name                     | COUNT(*) |
+------------------------------+----------+
| Jex Max Publication          | [illegible] |
| BPP Publication              | [illegible] |
| New Harrold Publication      | [illegible] |
| Ultra Press Inc.             | [illegible] |
| Mountain Publication         | [illegible] |
| Summer Night Publication     | [illegible] |
| Pieterson Grp. of Publishers | [illegible] |
| Novel Publisher Ltd.         | [illegible] |
+------------------------------+----------+
8 rows in set (0.17 sec)
```

All developers know how to write apps against databases

Automatic bi-directional data synch

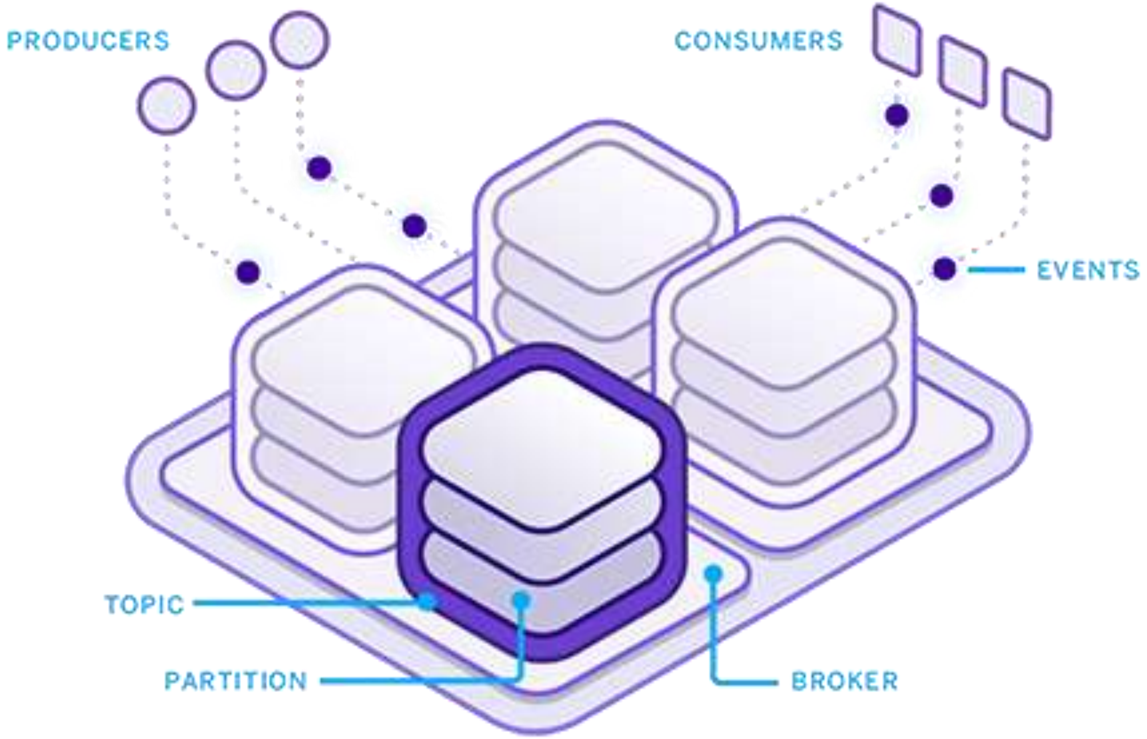
Point-and-click interface for connecting database fields with objects and fields in Salesforce

Supports multiple Salesforce orgs

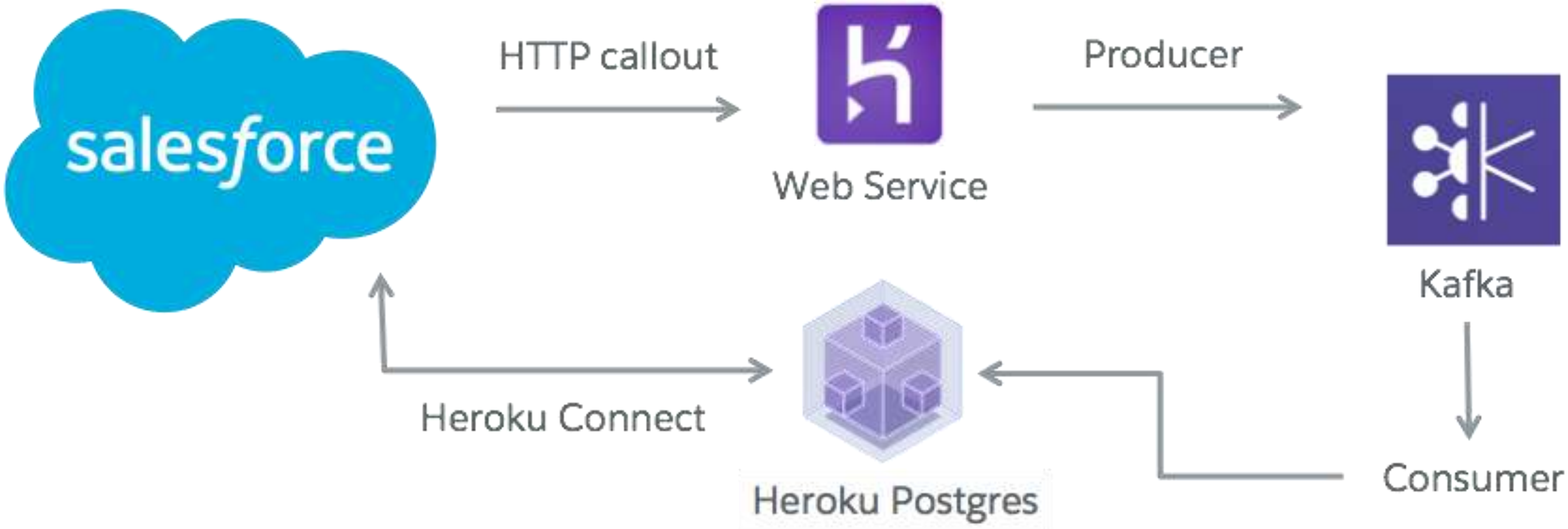
Supports Salesforce custom objects

Can dramatically reduce Force.com API call frequency

Apache Kafka on Heroku



Integration with Salesforce



Q&A

Thank You