

From Kubernetes to PaaS to... err, what's next?

Daniel Bryant | Head of DevRel, Ambassador Labs
@danielbryantuk

Spoiler alert!

From Kubernetes to PaaS to... err, what's next?

*My answer is **Golden Paths**, a.k.a. paved roads/paths/platforms*

The **real questions** are how much should **you build yourself**,
and how should **you assemble the control plane** for effective use?

Platform Engineering is a key to this

@danielbryantuk (he/him)

The first screenshot shows the Ambassador Labs website, featuring sections for DockerCon, CHAD exam, and Kubernetes resources.

The second screenshot is from InfoQ, showing a profile for Daniel Bryant with a photo of him speaking at a conference.

The third screenshot is from O'Reilly, showing the book cover for "Continuous Delivery in Java".



linktr.ee/danielbryantuk

Shift left... all the things??



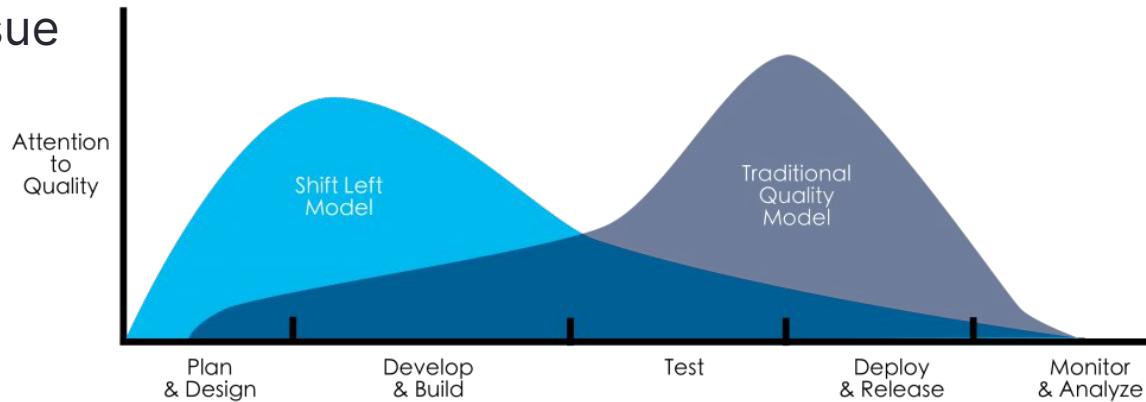
Developers are being told to “shift left”

Makes sense - think about the ‘ilities earlier

The abstractions, APIs, and tooling have to help us

2002... was “pre-DevOps” 🦖

Now, tool sprawl can be an issue





David Bell

@dastbe

...

Replying to @ReinH



2:49 AM · Sep 10, 2020 · Twitter Web App

twitter.com/dastbe/status/1303858170155081728

770 Retweets 182 Quote Tweets 3,460 Likes



Richard Li
@rdli

Excited for #KubeCon. But you know what this means 😬

...

THE TROUBLE WITH KUBERNETES TOOLS



7:00 PM · May 3, 2021 · Twitter Web App

6 Retweets 1 Quote Tweet 11 Likes

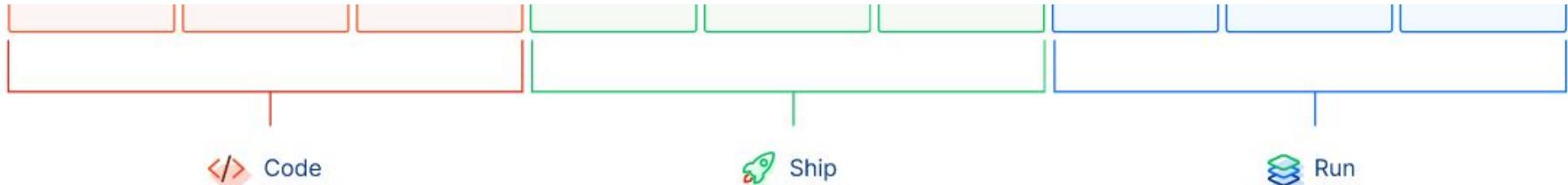
And each KubeCon doesn't help 😊

Kubernetes is a solid **foundation...**

Core requirements of a platform



Core app/dev platform requirements



- Configure & maintain dev / test environments
- Discover APIs available for coding



Ship

- Canary release new versions of a service safely to end users
- Understand which versions of a service are deployed and released



Run

- Mitigate issues with updates
- Monitor updates for anomalous behavior

getambassador.io/developer-control-plane

Kubernetes: Platform foundations



Daniel Bryant
@danielbryantuk

"I love Kubernetes. It's my favourite YAML database"
😂 @starbuxman at #DevoxxUK



5:41 PM · May 11, 2022 · Twitter for Android

| View Tweet analytics

21 Retweets 3 Quote Tweets 209 Likes



Emmanuel Bernard @emmanuelbernard · 13h
Replying to @danielbryantuk and @starbuxman

Well there is some fundamental truth to it. One key value of Kubernetes is his intent (as object) API and the fact that the intent is queryable to do the reconciliation loop.

In that sense Kube is the most important API database that happens to use YAML.



1



1



1



<https://twitter.com/danielbryantuk/status/1524429485621268481>

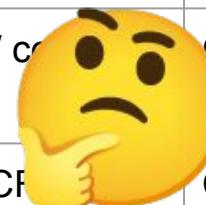
Back to the future...



Looking back at my dev career

Cognitive Load

Year (Approx)	App Architecture	Infra / Fabric	My (Developer) Responsibility	Developer Control Planes
2000	Monolith	In-house tin	Code	IDE, CVS, deploy portal
2005	Monolith / SOA	In-house / cloud	Code, ship, [limited run]	IDE, Mercurial, Jenkins, [ESB, MQs, Gateways]
2010	Monolith	Heroku / Cloud	Code, run	IDE, Git, Heroku CLI, Heroku UI, New Relic UI
2015	Microservices	Cloud	Code, ship, run	IDE, Git, Docker Hub, Jenkins+plugins, AWS Console, bash, Terraform, Chef...
2020	Microservices++	K8s	Full lifecycle (code, ship, run)++	IDE, Git, K8s



What did I learn?

Treat platform as a product



You can't have good DevX without good UX



Focus on workflows and tooling interoperability



Platform as Product



Platform as Product: The “Golden Path”

Successful organizations have long adopted Golden Paths, Paved Roads etc

- Netflix: < 2017
- Google: < 2018, see SRE book
- Spotify: < 2020
- Not on the High Street: ~2015
- GoSpotCheck: 2019
- Veterans United Home Loans: 2020
- Snyk: 2021

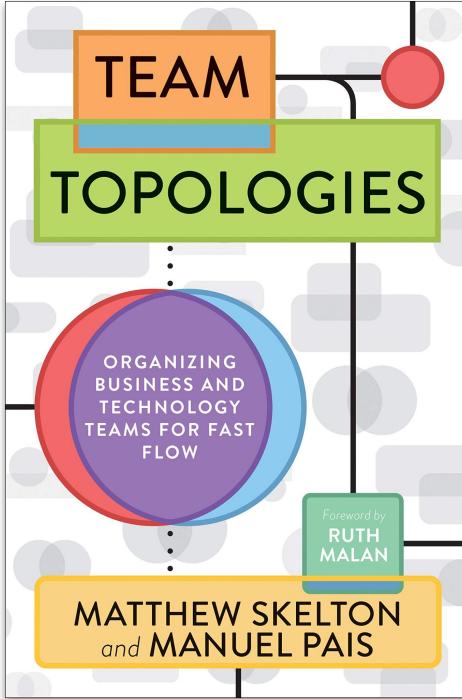
The figure consists of three vertically stacked screenshots from web browsers. The top screenshot shows a news article titled 'The "Paved Road" PaaS for Microservices at Netflix: Yunong Xiao at QCon NY' on the Infra.com website. It features a diagram showing a central 'Backend Services' box connected to multiple 'Frontend Services' boxes. The middle screenshot is from the Spotify Engineering blog, titled 'How We Use Golden Paths to Solve Fragmentation in Our Software Ecosystem'. It includes a large graphic of a winding path made of yellow blocks on a blue background. The bottom screenshot is from the Spotify Ambassador website, showing a navigation bar with 'ambassador' and links for 'Products', 'Developers', 'Company', and 'Pricing'. A small note on the page reads: 'OTE #13: Dave Sudia on Kubernetes Local Dev, Building a PaaS, and Platform Personas'.

**OTE #13: Dave Sudia
on Kubernetes Local
Dev, Building a PaaS,
and Platform Personas**

In the thirteenth episode of the Ambassador Livin' on the Edge podcast, Dave Sudia, Senior DevOps Engineer at GoSpotCheck, discusses creating an effective local developer experience for Kubernetes, migrating away from Heroku and building a Kubernetes-based platform as a service (PaaS), and how his team developed an understanding of all the personas involved with creating a platform.

Be sure to check out the additional episodes of the ["Livin' on the Edge" podcast](#).

Product-led



teamtopologies.com/videos-slides/what-is-platform-as-a-product-clues-from-team-topologies

Nicky Wrightson
@NickyWrightson

I strongly believe that companies need to invest heavily in platforms. Those platforms if staffed properly and developed with a strong user focus can really enable product teams to move quicker and safer. Not only that but can speed up onboarding as companies grow.

Gergely Orosz @GergelyOrosz · Sep 8
What are Platform teams, why are they important, and why do (almost) all high-growth companies and big tech have them? A thread.

1. The easiest way to visualize Platform teams is blocks of specific types. Other teams (called Product/Program) use these "blocks" to build.
[Show this thread](#)

A diagram showing two rows of building blocks. The top row, labeled 'PRODUCTS / PROGRAMS', contains three structures: a blue and red truck-like vehicle, a red and yellow boat-like vehicle, and a red and yellow rectangular block. The bottom row, labeled 'PLATFORMS', contains four groups of smaller blocks: red cubes, yellow cubes, blue cubes, and white cubes. Vertical dashed lines separate the blocks into columns corresponding to the structures in the top row.

1:39 PM · Sep 9, 2021 · Twitter for Android

twitter.com/NickyWrightson/status/1435945868721541120

Ambassador Labs: Drinking our own



- We use our own tools & products
- CNCF Emissary-ingress & Telepresence are integral parts of our platform
- Staffed appropriately
 - Dedicated platform/infra “product” team
 - Interviews/retros on usage
 - Onboarding & training

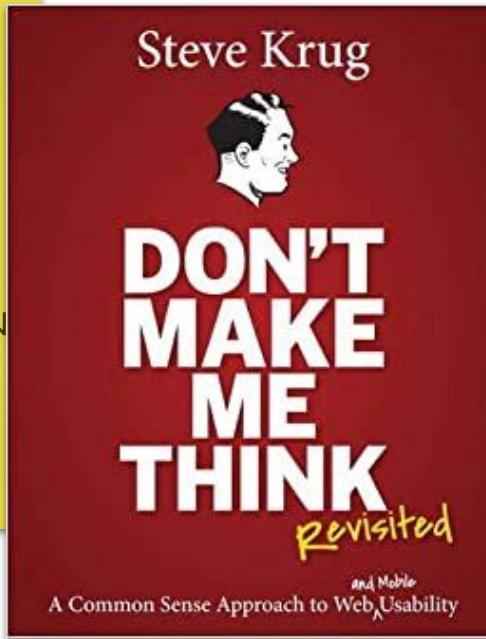
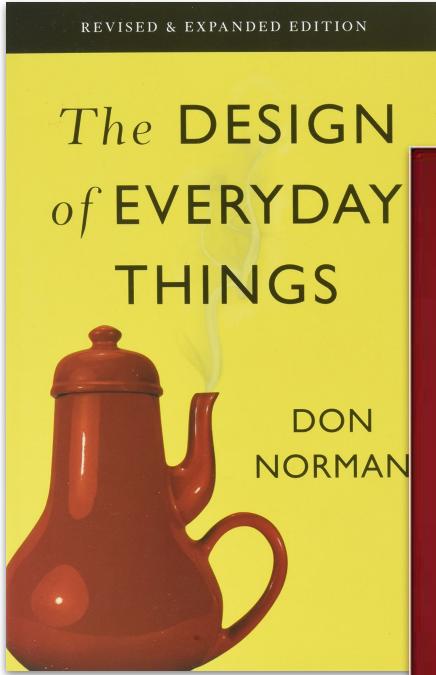
The screenshot shows a Medium blog post titled "Deploying Our Pull Requests in Flight: Previewing WIP in K8s" by Alex Gervais. The post discusses the use of Telepresence for local development of the Ambassador Cloud platform. It highlights how Telepresence allows individual developers to access staging and production APIs to iterate quickly against a remote environment. The post includes a preview image of the Ambassador logo and the title text. Below the post, there's a section titled "At the beginning: Single-threaded review loops" which describes the workflow and its evolution over time. The sidebar on the right lists other posts from the author and "More from Medium". At the bottom, there are links for help, status, writers, blog, careers, privacy, terms, and about.

blog.getambassador.io/deploying-our-pull-requests-in-flight-previewing-wip-in-k8s-7aba18de46d4

You can't have good DevX
without good UX

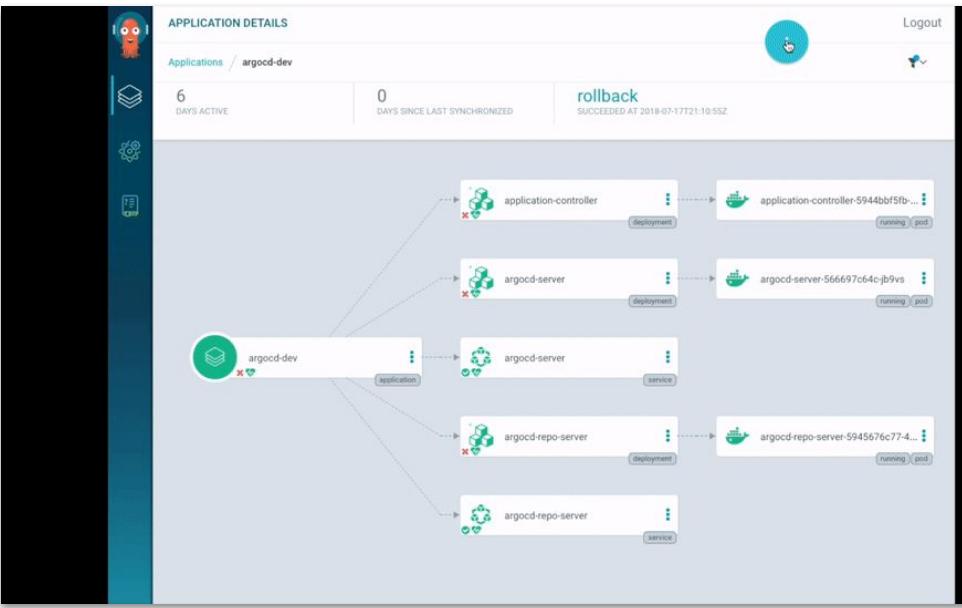


Good UX (for platforms)



- Think personas
 - Platform experts
 - The "hipster engineer"
 - The "[99% developer](#)"
- User research is key
- Watch users in their daily tasks (with your tooling)

Shout out to the Argo Project



intuitdep20c81:~ dthomson\$ kubectl argo rollouts get rollout canary-demo										
Name:	canary-demo									
Namespace:	default									
Status:	✓ Healthy									
Strategy:	Canary									
Step:	6/6									
SetWeight:	100									
ActualWeight:	100									
Images:	argoproj/rollouts-demo:green (stable)									
Replicas:										
Desired:	5									
Current:	5									
Updated:	5									
Ready:	5									
Available:	5									
NAME										
canary-demo										
# revision:4										
└─ canary-demo-877894d5b										
└─ canary-demo-877894d5b-2thr7										
└─ canary-demo-877894d5b-ccgcf										
└─ canary-demo-877894d5b-595wl										
└─ canary-demo-877894d5b-gw2mz										
└─ canary-demo-877894d5b-4665p										
└─ canary-demo-877894d5b-4-success-rate										
└─ canary-demo-877894d5b-4-success-rate.1										
└─ AnalysisRun × Failed										
└─ AnalysisRun ✓ Successful										
└─ 7h39m ✓ 6										
# revision:3										
└─ canary-demo-6758949f55										
└─ canary-demo-6758949f55-3-success-rate										
└─ canary-demo-6758949f55-3-success-rate.1										
└─ AnalysisRun × Failed										
└─ AnalysisRun ✓ Successful										
└─ 8h ✓ 12, × 1										
# revision:2										
└─ α canary-demo-877894d5b-2-success-rate										
└─ AnalysisRun △ Error										
└─ 26h △ 5										

argoproj.github.io/argo-cd

argoproj.github.io/argo-rollouts

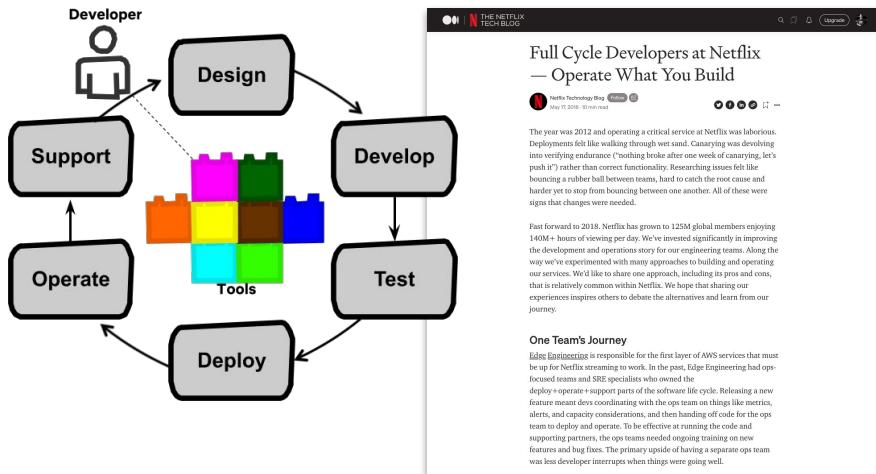
infoq.com/podcasts/continuous-delivery-with-kubernetes/

Workflow and interop



Workflow and interop

“[The] centralized [platform] teams act as force multipliers by turning their specialized knowledge into reusable building blocks.”



netflixtechblog.com/full-cycle-developers-at-netflix-a08c31f83249

“A good deal of the job is ultimately about finding the right balances between standardization and autonomy”

Galo Navarro

Talk write-up: "How to build a PaaS for 1500 engineers"

Jan 2, 2020

This article is based on a presentation I gave as part of [Adewinta Talks](#) in Barcelona on November 2019. I'm experimenting with this format: I went through the slides typing what I'd speak over them, edited the text, and added some of the most relevant slides in between paragraphs. [Let me know](#) how it works.

[Discussion in Hacker News](#)

Today's topic is about Technical Infrastructure, a term I found first in a [great talk by Will Larson](#). He defines Technical Infrastructure as "the software and systems to create, evolve, and operate our businesses." That includes Cloud services, build tools, compilers, editors, source control systems, data infrastructure (Kafka, Hadoop, Airflow...), routing and messaging systems (Envoy, gRPC, Thrift...), Chef, Consul, Puppet, Terraform, and so on.

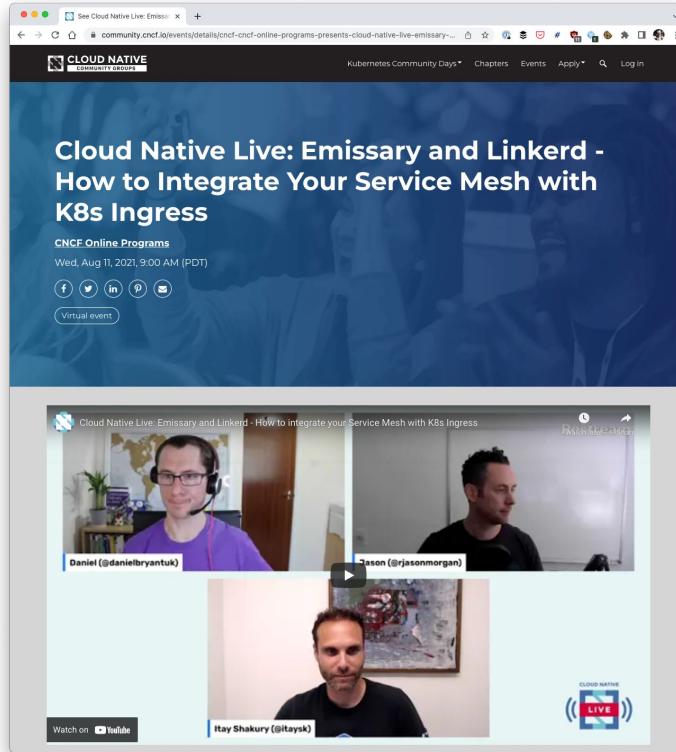
Companies that reach a certain size typically create one or more teams that take care of different subsets of these tools. They get named something like "infrastructure", "platform", "foundations"... I will use "Platform team" in this text.

If you have been part of one, you will know that life for a Platform team is tough. I could find an actual picture that shows one of them on the field:

Pieter Brueghel the Elder - "The Triumph of Death" (1562)

srvaroa.github.io/paas/infrastructure/platform/kubernetes/cloud/2020/01/02/talk-how-to-build-a-paas-for-1500-engineers.html

Interop Example: Emissary-ingress & Linkerd



- CNCF projects
 - Emissary-ingress: n/s gateway
 - Linkerd: e/w service mesh
- Both use Kubernetes Resource Model (KRM)
 - CRDs, controllers, best practices
- One line config integration

```
kubectl -n emissary get deploy emissary-ingress -o yaml | \
linkerd inject --skip-inbound-ports 80,443 - | \
kubectl apply -f -
```

So, where (as a community) are we now?



The need for a platform control plane emerges

?



- Configure & maintain dev / test environments
- Discover APIs available for coding

- Canary release new versions of a service safely to end users
- Understand which versions of a service are deployed and released

- Mitigate issues with updates
- Monitor updates for anomalous behavior

getambassador.io/developer-control-plane



Kelsey Hightower

@kelseyhightower

I'm convinced the majority of people managing infrastructure just want a PaaS. The only requirement: it has to be built by them.

12:08 AM · Apr 12, 2017 · Twitter Web Client

459 Retweets 78 Quote Tweets 1,254 Likes

twitter.com/kelseyhightower/status/851935087532945409



This is the golden path(s)



...



Kelsey Hightower

@kelseyhightower

Replying to [@kelseyhightower](#)

The delta between Kubernetes and a developer friendly PaaS is where the next layer of value is and where things tend to get opinionated -- a requirement for reliable end to end workflows.

6:02 PM · Feb 24, 2019 · Twitter Web Client

21 Retweets 6 Quote Tweets 116 Likes



twitter.com/kelseyhightower/status/1099731286950727680

Building the golden path(s)

Pinned Tweet

 Daniel Bryant
@danielbryantuk

"Platform Engineering" is rapidly becoming the new DevOps or SRE. Almost every day we hear about another org building an internal developer platform or control plane.

Want to know what platform engineering is, where the trends are going, and why you should care?

Read on  

10:06 AM · Feb 18, 2022 · Twitter Web App

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892 Retweets 127 Quote Tweets 3,670 Likes

 Daniel Bryant
@danielbryantuk

Platform Engineering takeaways from talking to the amazing [@alanmbarr](#), Bo Daley, & [@cfhirschorn](#) on the [@ambassadorlabs](#) podcast 

- Be opinionated with your developer platform
- Share the why as well as how
- Eliminate toil
- Recognize the "sociotechnical system"

Read on  

8:52 AM · May 6, 2022 · Typefully

 View Tweet analytics

9 Retweets 29 Likes

twitter.com/danielbryantuk/status/1494614250567966732
twitter.com/danielbryantuk/status/1522484338880761857

Ambassador Labs Podcast Insights

- Successful orgs are investing in Golden Paths (and platform teams)
- Start small, get big. This should be developer-led (“bottom up”)
- Communicate the long-term vision (and biz goals) of your platform
- Recognize the sociotechnical factor: adopt a “hospitality” focus
- A good UI “paints a thousand CLIs” (although show the CLI some ❤️)
- Eliminate toil: “automate and create” to remove friction
- Adopt standards: APIs, GitOps, Kubernetes Resource Model (CRDs)

getambassador.io/resources/accelerating-kubernetes-for-cloud-native-organizations

Developers, developers, developers...



The need for a platform control plane emerges

?



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getambassador.io/developer-control-plane

The need for a **developer** control plane (DCP)

?



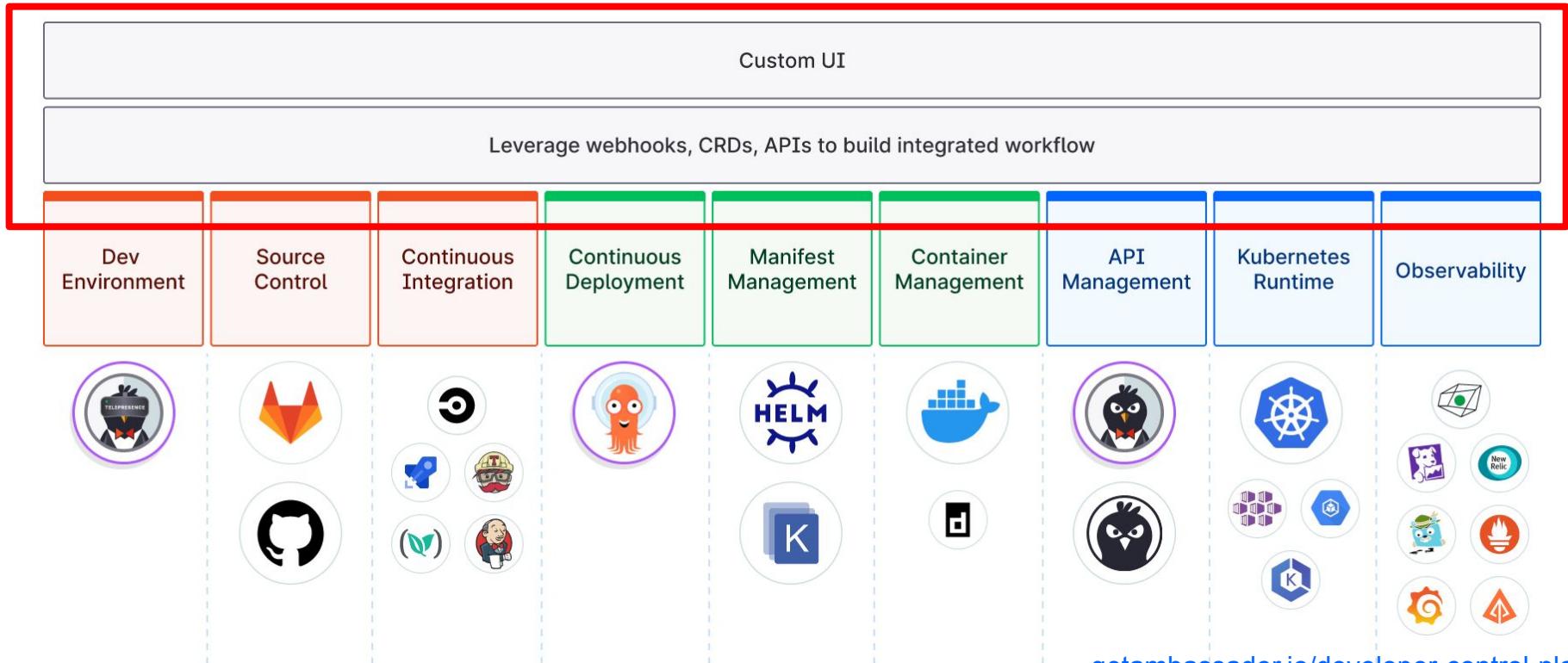
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getambassador.io/developer-control-plane

The CNCF ecosystem is the foundation for a modern developer control plane



getambassador.io/developer-control-plane

Wrapping up



From Kubernetes to PaaS to... Golden Paths

When creating a Golden Path: how much should **you build yourself**, and how should **you assemble the control plane** for effective use?

- Treat platform as a product
- Realise that you can't have good DevX without good UX
- Focus on workflows and tooling interop: developer(-led) control plane

This is the role of
Platform Engineer

Daniel Bryant
@danielbryantuk ...

"You don't want a 10x developer... what you want is someone that can come in and make 10 other developers more productive"

@kelseyhightower on the value of codifying knowledge and automating workflows e.g. via @Docker Extensions

#DockerCon



6:40 PM · May 10, 2022 · Twitter Web App

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128 Retweets 17 Quote Tweets 655 Likes

<https://twitter.com/danielbryantuk/status/1524082079897694208>

Thank you!

db@datawire.io | [@danielbryantuk](https://twitter.com/danielbryantuk)

a8r.io/slack



Booth S30!

(We're not a pizza vendor



[Golden Path Pizza Party](#) 

[Platform Engineering Guide](#) 

(And we're hiring! www.getambassador.io/about-us/careers)