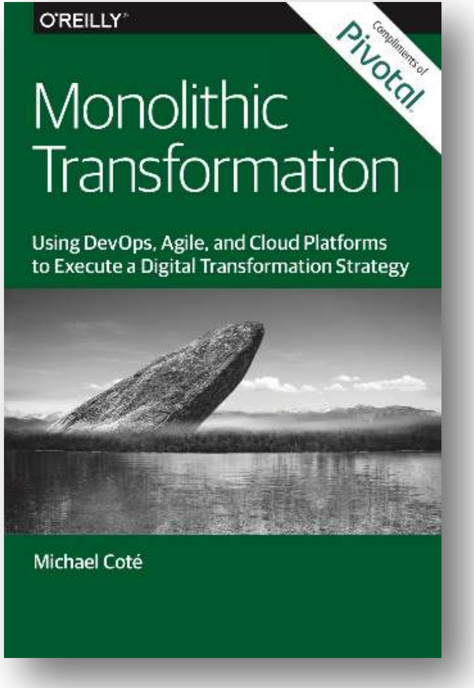
Platform as a Product

Transforming from service delivery into continuous operations

Warsaw Java User’s Group
March, 2019
@cote

Businesses make more money with better software



O'REILLY

Compliments of Pivotal

Monolithic Transformation

Using DevOps, Agile, and Cloud Platforms to Execute a Digital Transformation Strategy

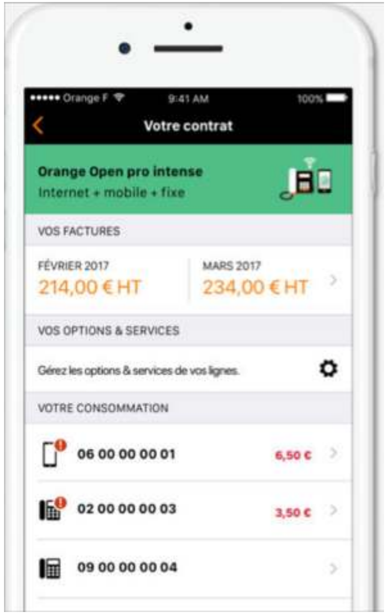
Michael Coté

- Faster cycles leady to autonomy, productivity, & better product design.
- DevOps helped, but the wall of confusion is now the wall of yaml.
- Platform ops reduces toil, delivers as a product, creating prod. resilience.
- Developers move to product teams, adding product managers, & designers.
- Teams use agile practices, fast release cycles to force lean product management & higher productivity.
- Leadership re-programs the organization, defining & managing 1,000's of teams, gardening culture.
- Start small, rotating pairs across teams, with quarterly, internal marketing.

> “Our developers are now totally focused on our customers and the user experience.”
>
> *Xavier Perret, Orange France*

orange™

A new business app in ⅓ less time, used by 50% of customers



••••• Orange F 9:41 AM 100%

Votre contrat

Orange Open pro intense

Internet + mobile + fixe

VOS FACTURES

FÉVRIER 2017	MARS 2017
214,00 € HT	234,00 € HT

VOS OPTIONS & SERVICES

Gérez les options & services de vos lignes.

VOTRE CONSOMMATION

06 00 00 00 01	6,50 €
02 00 00 00 03	3,50 €
09 00 00 00 04	

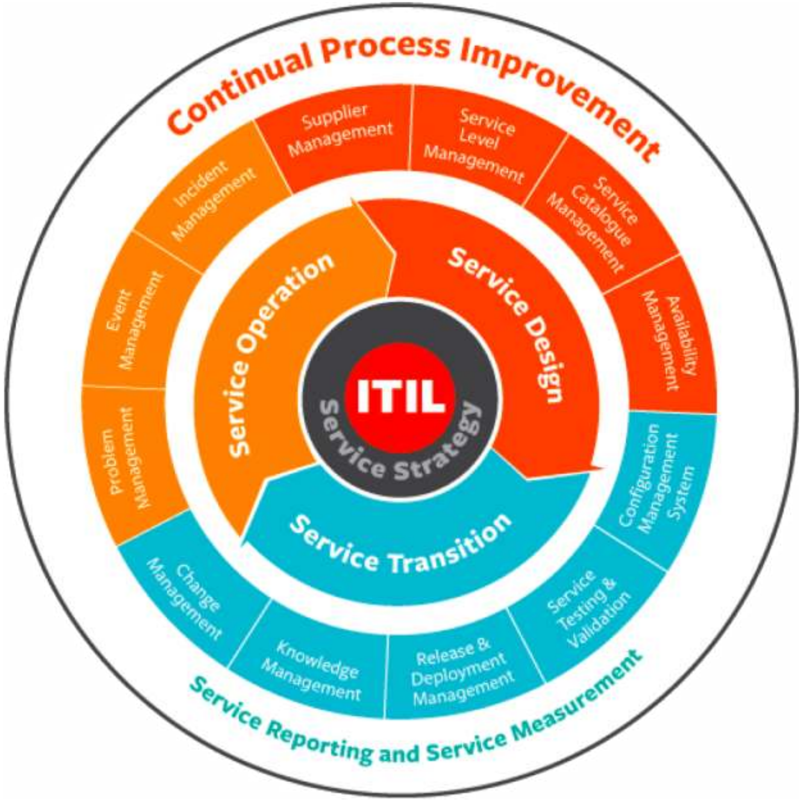
Source "Going Cloud-Native at Orange France," Pivotal Insights #53, 2018; "Transformation Digitale de la Direction Enterprise France," Philippe Benaben, Gan Zifroni, Nicolas Gilot, Orange France, July 2018

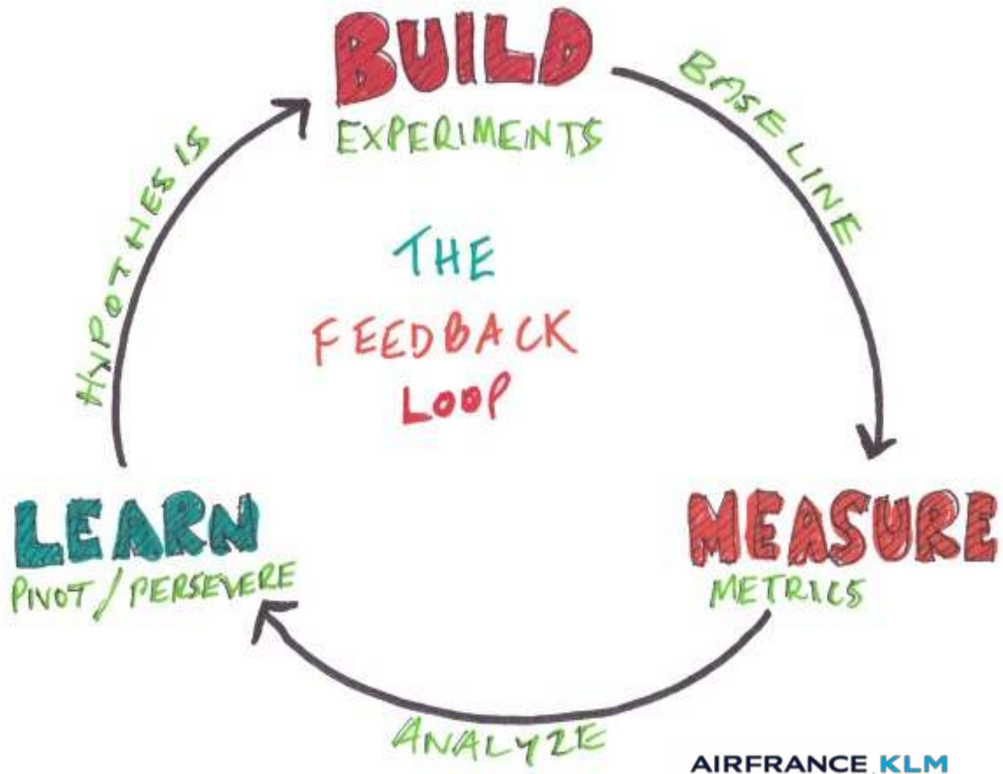
HA HA!

BUSINESS

How it’s done

Shift from *Service* Delivery to *Product* Delivery





Pivotal

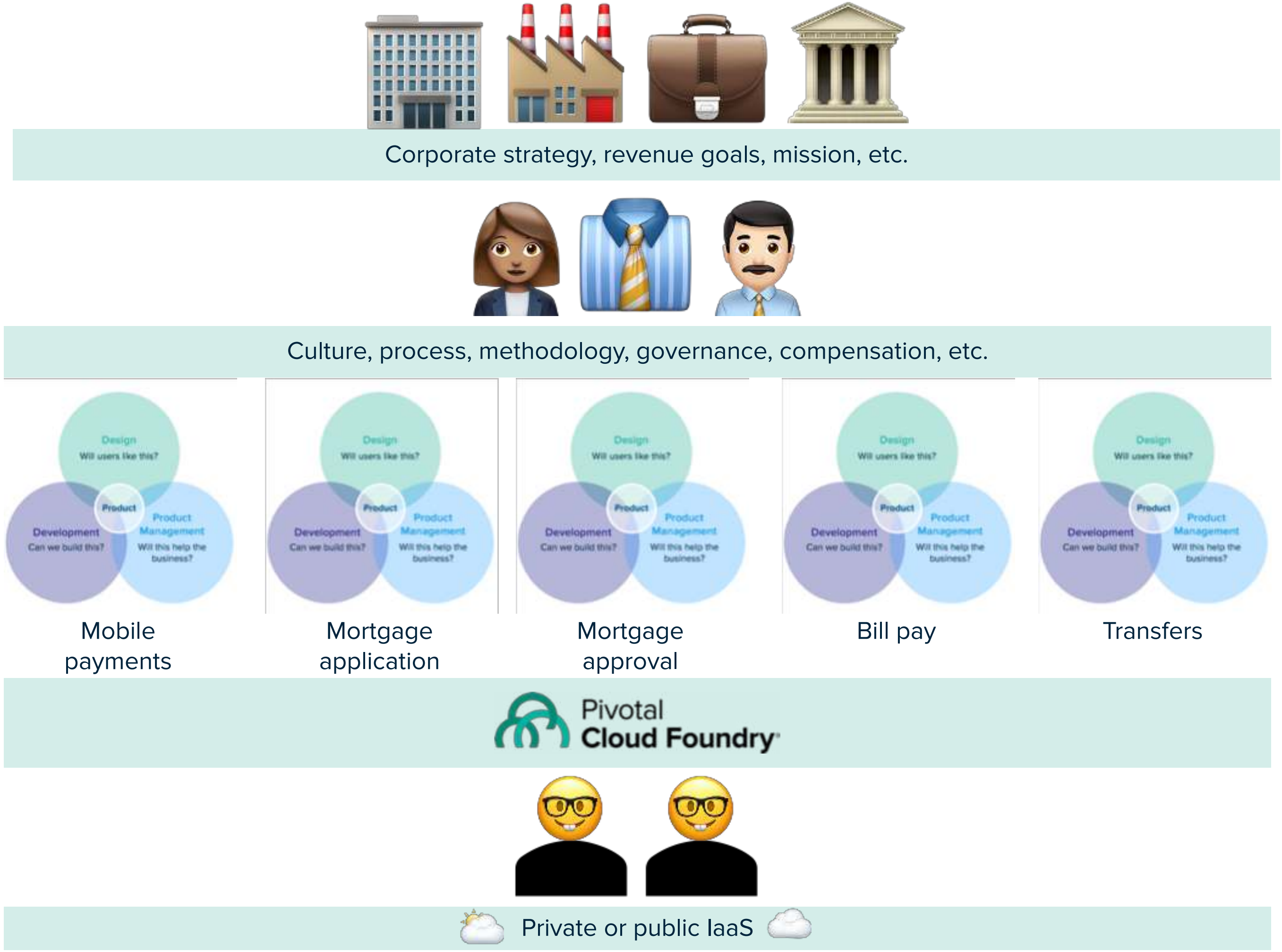
Sources: BMC's ITIL® Processes & Best Practices documents, 2011 to 2016; "Sky is the Limit for Cloud Foundry at AirFrance-KLM," Nathan Wattimena & Fabien Lebrere, AirFrance-KLM, Oct. 2018.; "Why Change? Small batch thinking," Coté, Sep. 2018.

“The Business”

Leadership, EAs, etc.

Product teams

Platform Engineers



Corporate strategy, revenue goals, mission, etc.

Culture, process, methodology, governance, compensation, etc.

Mobile payments

Mortgage application

Mortgage approval

Bill pay

Transfers

Pivotal Cloud Foundry

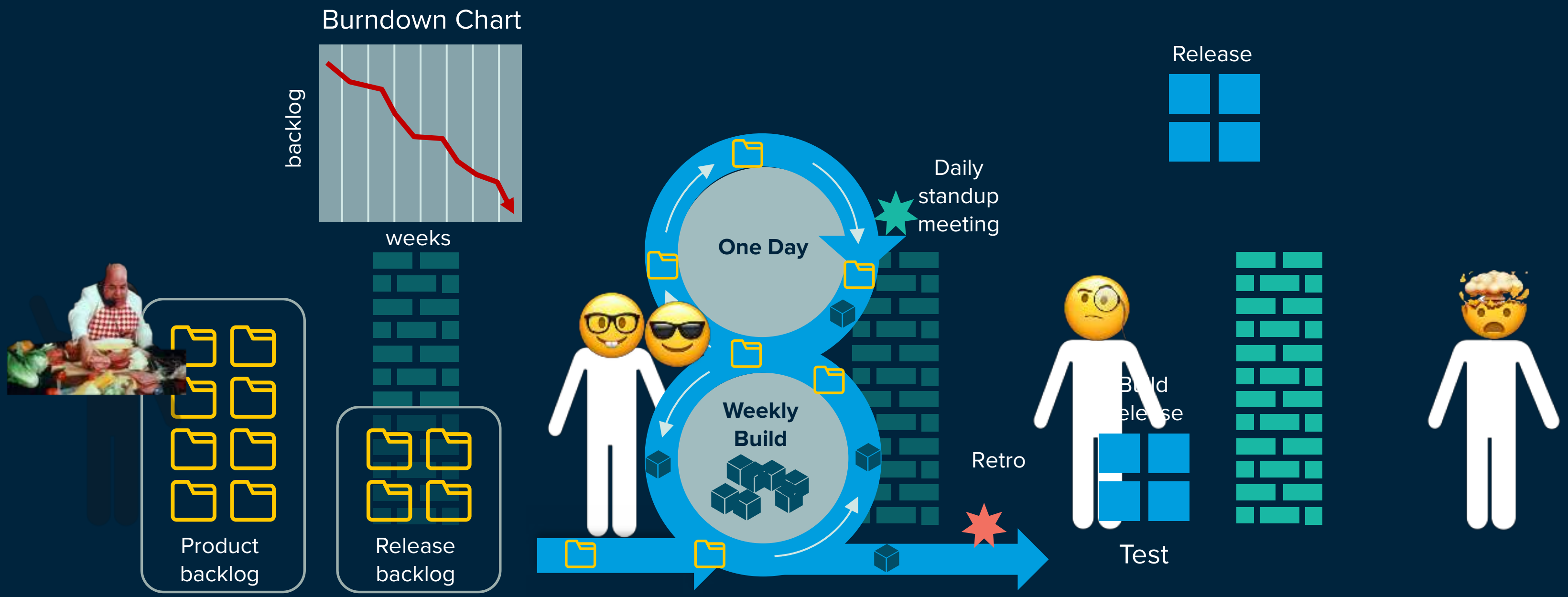
Private or public IaaS

Balanced teams using weekly releases to production create better software

THALES Allstate DUKE ENERGY Allianz

Pivotal

A tale of two walls



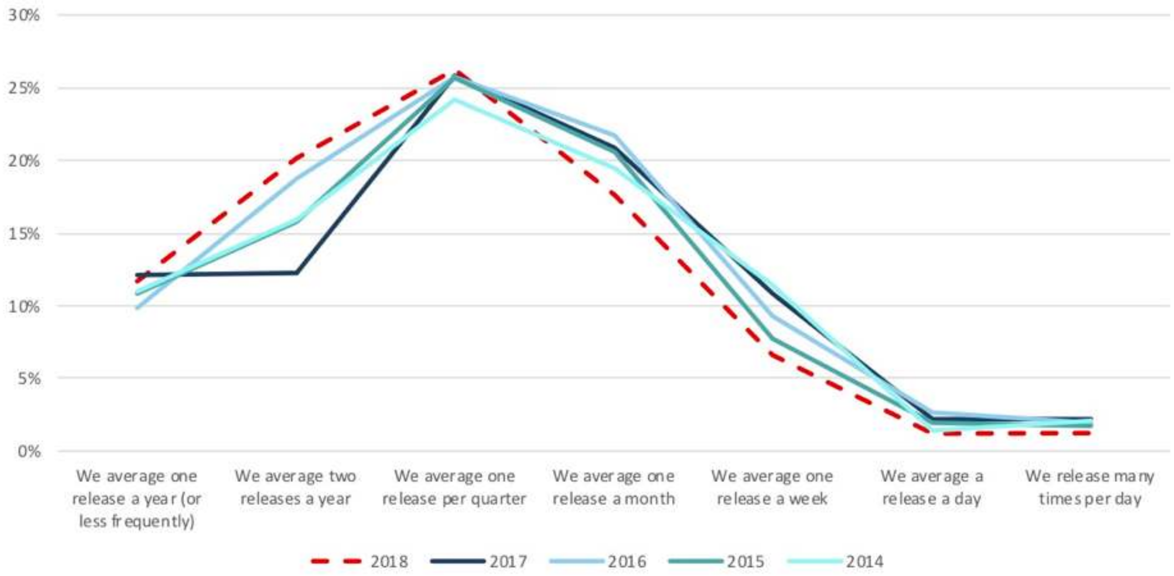
BUSINESS

DEVELOPMENT

OPERATIONS

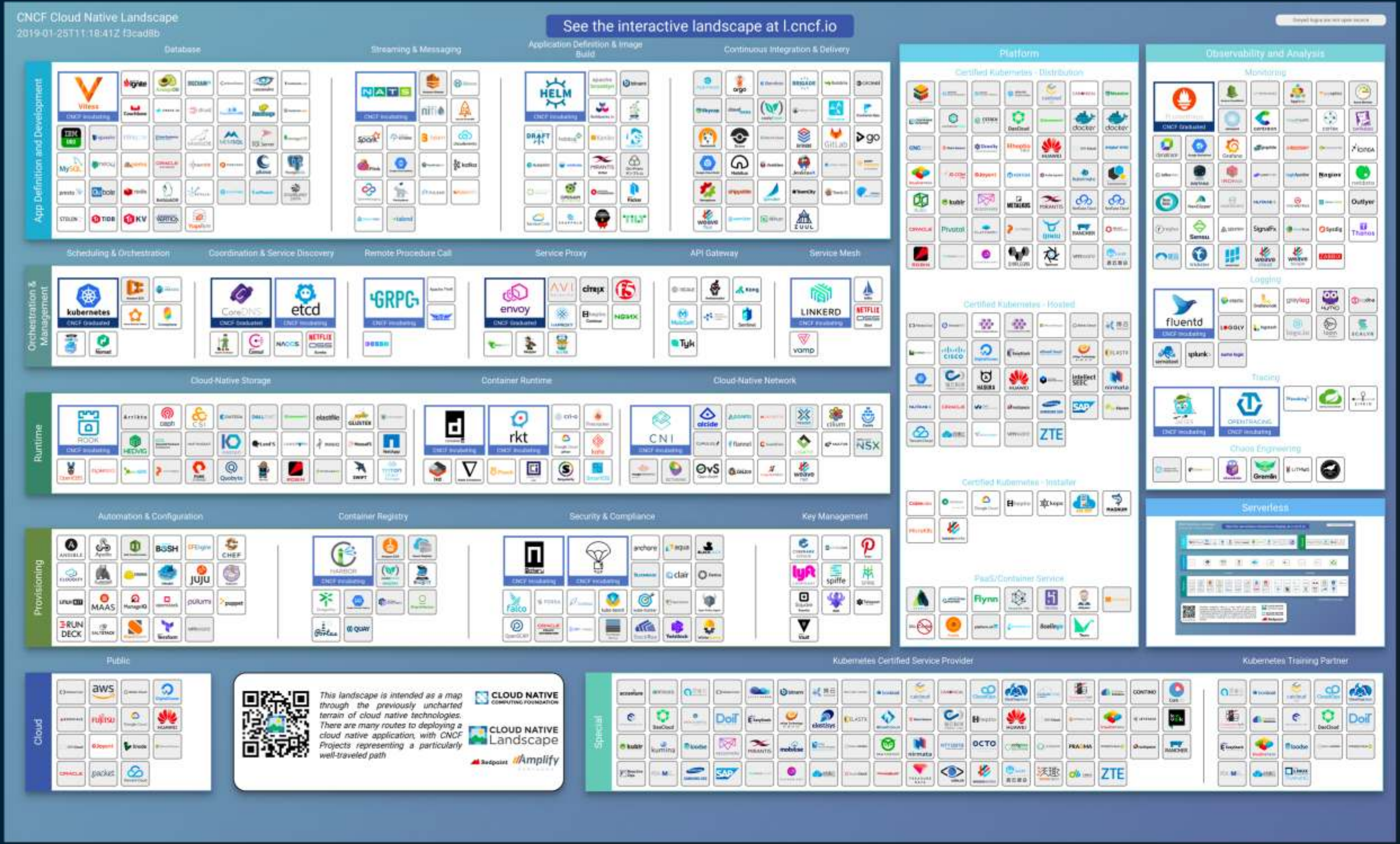
We’ve made progress, but we’ve got to keep trying

“How often does your team or teams release applications?”



Base (2018): 3,228 Developers
Base: 546-719 Developers who work for a software company, for internal IT, or in technology services
Source: Forrester Business Technographics Developer Survey, 2014-2018.

Source: “CEOs and Software,” Rymer & Hammond, Forrester, Jan 2019.


CNCF Cloud Native Landscape
2019-01-25T11:18:41Z f3cad8b
See the interactive landscape at l.cncf.io
App Definition and Development
Database
Streaming & Messaging
Application Definition & Image Build
Continuous Integration & Delivery
Orchestration & Management
Scheduling & Orchestration
Coordination & Service Discovery
Remote Procedure Call
Service Proxy
API Gateway
Service Mesh
Runtime
Cloud-Native Storage
Container Runtime
Cloud-Native Network
Provisioning
Automation & Configuration
Container Registry
Security & Compliance
Key Management
Platform
Certified Kubernetes - Distribution
Certified Kubernetes - Hosted
Certified Kubernetes - Installer
PaaS/Container Service
Observability and Analysis
Monitoring
Logging
Tracing
Chaos Engineering
Serverless
Cloud
Public
Special
Kubernetes Certified Service Provider
Kubernetes Training Partner
CLOUD NATIVE COMPUTING FOUNDATION
CLOUD NATIVE Landscape
Redpoint
Amplify

This landscape is intended as a map through the previously uncharted terrain of cloud native technologies. There are many routes to deploying a cloud native application, with CNCF Projects representing a particularly well-traveled path

```
apiVersion: v1
kind: Service
metadata:
  name: mysql
spec:
  ports:
    - port: 3306
      protocol: TCP
  selector:
    app: mysql

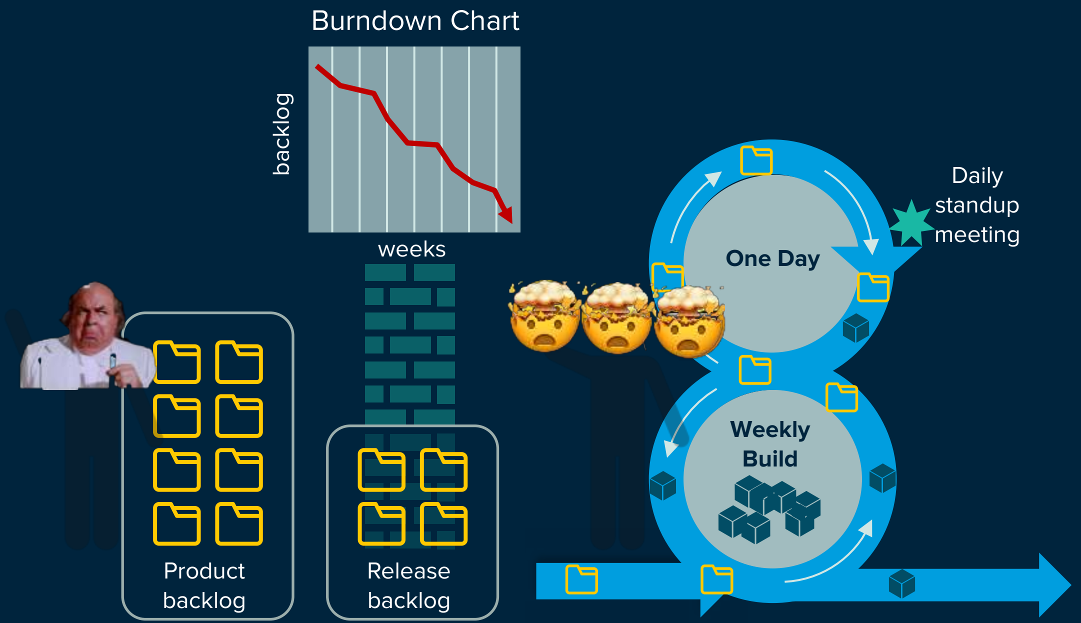
apiVersion:
extensions/v1beta1
kind: ReplicaSet
metadata:
  name: mysql
  labels:
    app: mysql
spec:
  replicas: 1
  selector:
    matchLabels:
      app: mysql
  template:
    metadata:
      labels:
        app: mysql
    spec:
      containers:
```

```
- name: database
        image: mysql:5.6
        resources:
          requests:
            cpu: 1
            memory: 1Gi
        livenessProbe:
          tcpSocket:
            port: 3306
        ports:
        - containerPort: 3306
        env:
          - name: MYSQL_ROOT_PASSWORD
            valueFrom:
              secretKeyRef:
                name: mysqlsecret
                key: database.password
          - name: MYSQL_USER
            valueFrom:
              secretKeyRef:
                name: mysqlsecret
                key: database.username
          - name: MYSQL_PASSWORD
            valueFrom:
              secretKeyRef:
                name: mysqlsecret
                key: database.password
```

```
    - name: MYSQL_DATABASE
      valueFrom:
        secretKeyRef:
          name: mysqlsecret
          key: database.name
  volumeMounts:
    -  name: database
       mountPath: /var/lib/mysql
volumes:
  -  name: database
     persistentVolumeClaim:
       claimName: database

apiVersion: v1
kind: PersistentVolume
metadata:
  name: database
  labels:
    volume: mysqlvolume
spec:
  accessModes:
    - ReadWriteMany
  capacity:
    storage: 1Gi
  hostPath:
    path: /data/pv0002/
```

Source: Ben Wilcock's Musical Kubernetes Cluster.



BUSINESS

DEVELOPMENT

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extensions/v1beta1
kind: ReplicaSet
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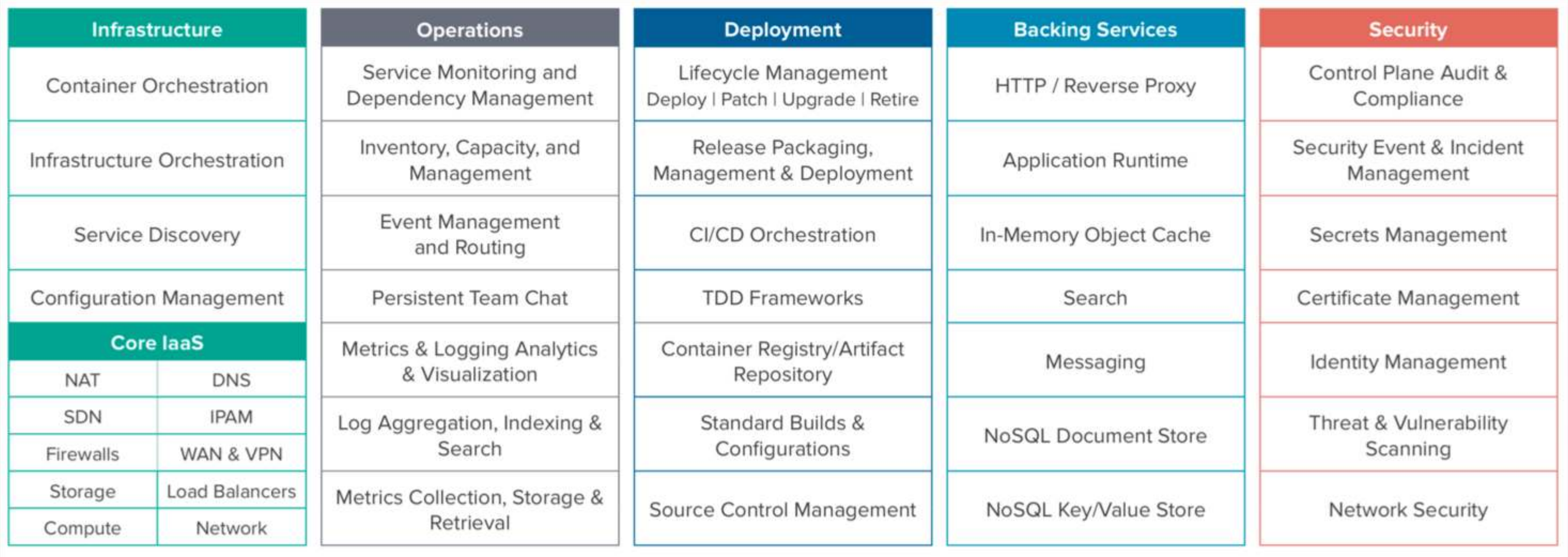
  name: mysql
  labels:
    app: mysql
spec:
  replicas: 1
  selector:
    matchLabels:
      app: mysql
  template:
    metadata:
      labels:
        app: mysql
    spec:
      containers:
```

Standardize on a platform



Infrastructure	Operations	Deployment	Backing Services	Security
Container Orchestration	Service Monitoring and Dependency Management	Lifecycle Management Deploy | Patch | Upgrade | Retire	HTTP / Reverse Proxy	Control Plane Audit & Compliance
Infrastructure Orchestration	Inventory, Capacity, and Management	Release Packaging, Management & Deployment	Application Runtime	Security Event & Incident Management
Service Discovery	Event Management and Routing	CI/CD Orchestration	In-Memory Object Cache	Secrets Management
Configuration Management	Persistent Team Chat	TDD Frameworks	Search	Certificate Management
Core IaaS NAT DNS	Metrics & Logging Analytics & Visualization	Container Registry/Artifact Repository	Messaging	Identity Management
SDN IPAM Firewalls WAN & VPN	Log Aggregation, Indexing & Search	Standard Builds & Configurations	NoSQL Document Store	Threat & Vulnerability Scanning
Storage Load Balancers Compute Network	Metrics Collection, Storage & Retrieval	Source Control Management	NoSQL Key/Value Store	Network Security

Pivotal

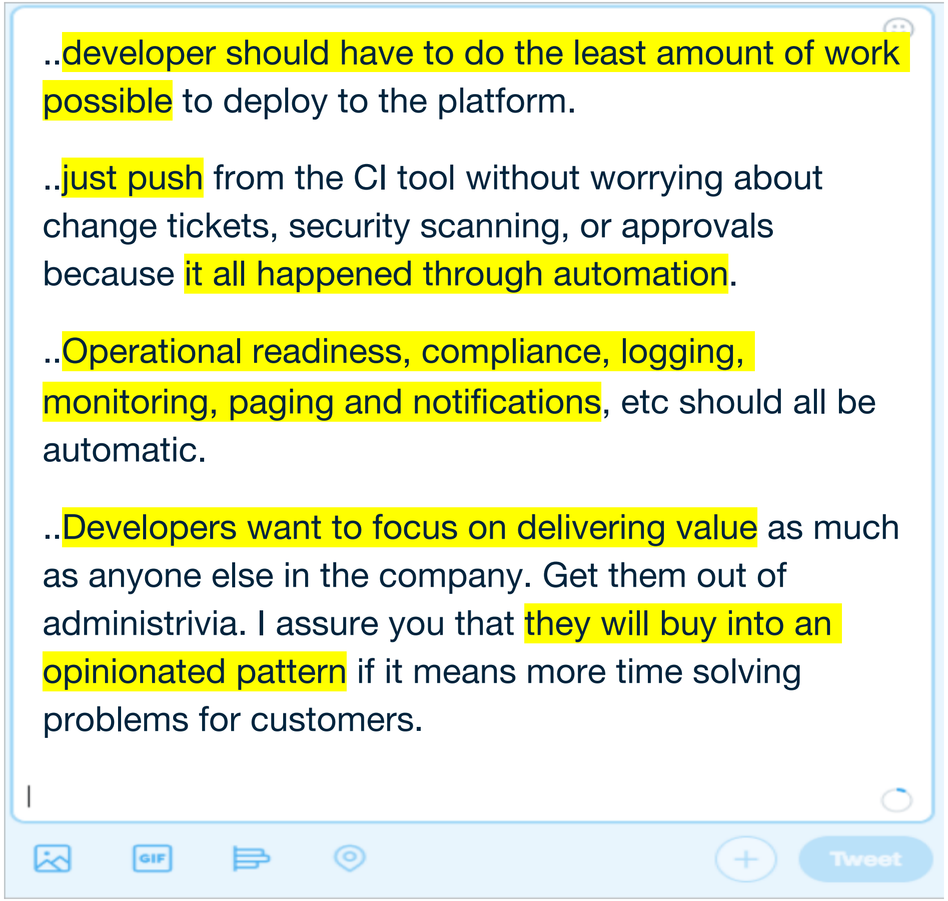
Source: "The Upside-Down Economics of Building Your Own Platform," Jared Ruckle and Matt Walburn, 2017 and 2018.

Less yaml coding

Matthew Curry
@mattjcurry

(previously Director,
Cloud Engineering)
Allstate

https://twitter.com/mattjcurry/status/1017953790345875456
July 2018



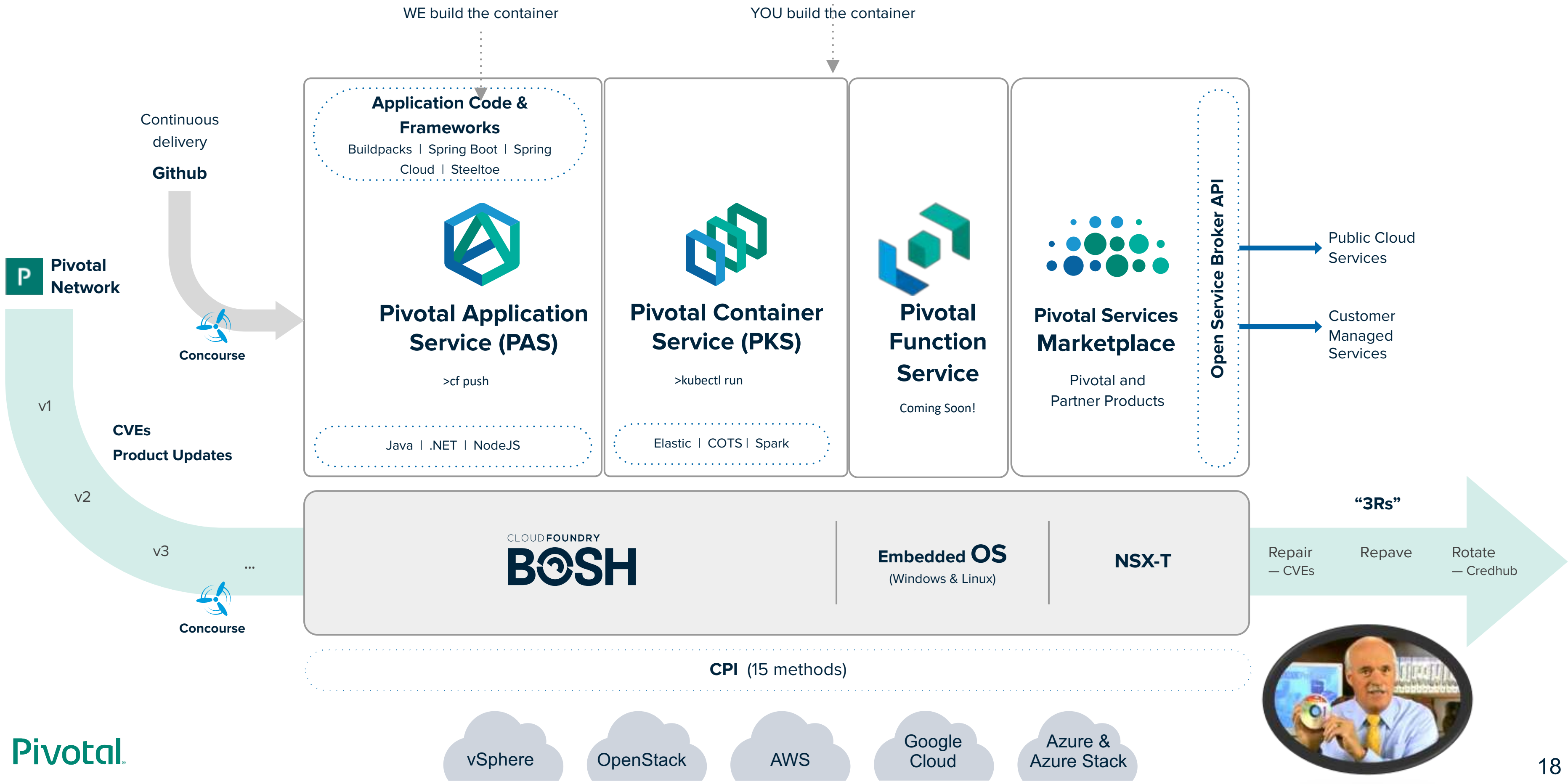
..developer should have to do the least amount of work possible to deploy to the platform.

..just push from the CI tool without worrying about change tickets, security scanning, or approvals because it all happened through automation.

..Operational readiness, compliance, logging, monitoring, paging and notifications, etc should all be automatic.

..Developers want to focus on delivering value as much as anyone else in the company. Get them out of administrivia. I assure you that they will buy into an opinionated pattern if it means more time solving problems for customers.

A consistent platform (with less yaml)



WE build the container

YOU build the container

Continuous delivery

Github

Pivotal Network

Concourse

v1

CVEs

Product Updates

v2

v3

...

Concourse

Application Code & Frameworks

Buildpacks | Spring Boot | Spring Cloud | Steeltoe

Pivotal Application Service (PAS)

>cf push

Java | .NET | NodeJS

Pivotal Container Service (PKS)

>kubectl run

Elastic | COTS | Spark

Pivotal Function Service

Coming Soon!

Pivotal Services Marketplace

Pivotal and Partner Products

Open Service Broker API

Public Cloud Services

Customer Managed Services

CLOUD FOUNDRY **BOSH**

Embedded OS

(Windows & Linux)

NSX-T

"3Rs"

Repair
— CVEs

Repave

Rotate
— Credhub

CPI (15 methods)

vSphere

OpenStack

AWS

Google Cloud

Azure & Azure Stack

Pivotal.

> “The promise we made to our developers is that life will get simpler.”

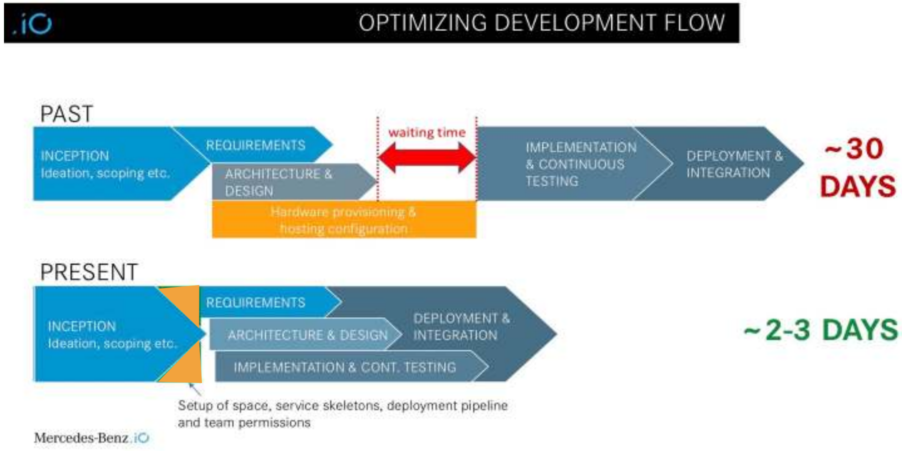
Vincent Oostindië, Rabobank

Source: Presentation at SpringOne Platform, Sep 2018.

Rabobank

Team functions

Finding toil: what does it take to deploy one line of code?



DAIMLER

Functions

- Removes toil with automation & programming
- Stands up & manages the platform
- Creates shared services/middleware/etc.

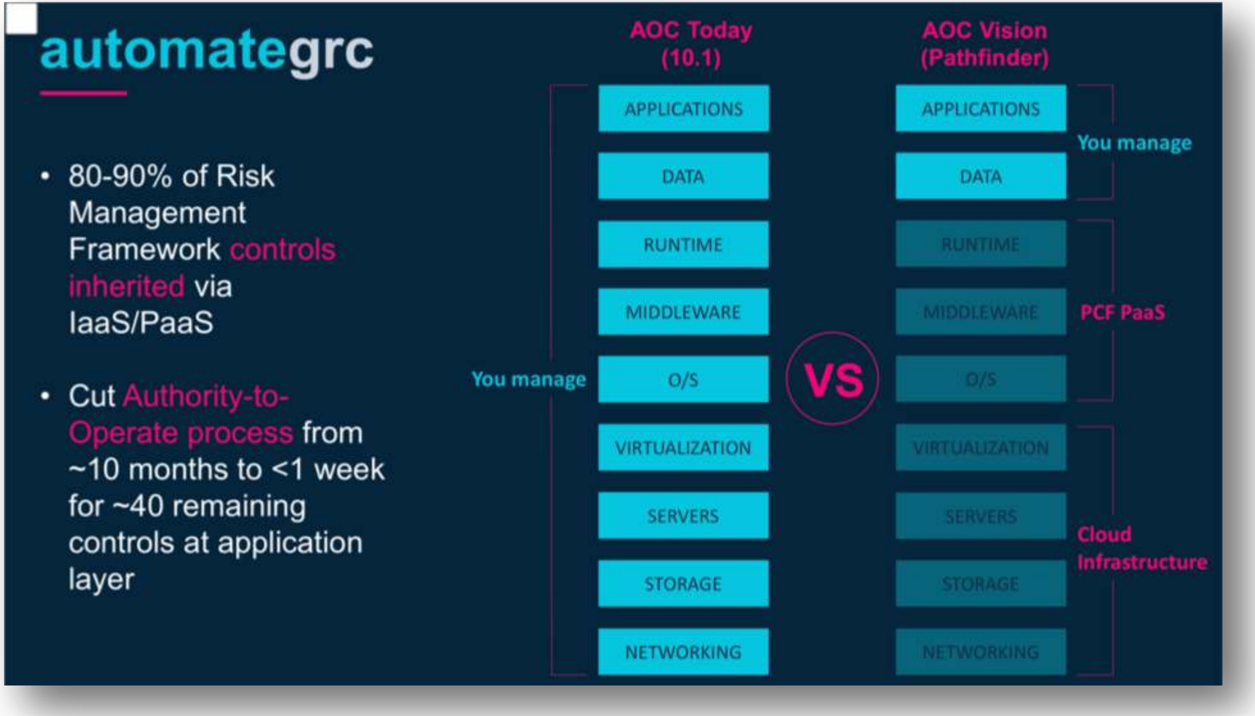
Insane staff efficiency

- T-Mobile USA: 8 ops to 300 developers, 11k containers.
- Dick’s Sporting Goods: 6 ops to 120 devs.
- Well Fargo: repaves production every 3 days

Pivotal

Source: "Adopting PCF At An Automobile Manufacturer," Thomas Seibert and Gregor Zurowski, s1p 2017.

A consistent, trusted platform automates waste, focusing on product support



automategrc

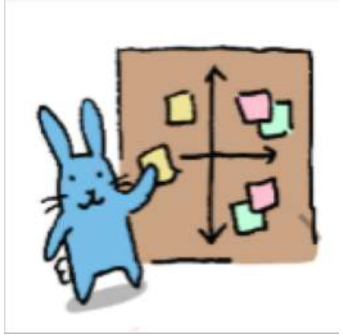
- 80-90% of Risk Management Framework controls inherited via IaaS/PaaS
- Cut Authority-to-Operate process from ~10 months to <1 week for ~40 remaining controls at application layer

Pivotal

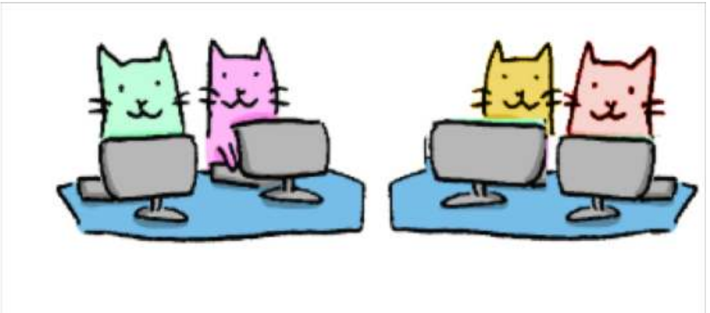
"Cost of Delay - How PCF Helped Demonstrate the DoD Can't Afford Business as Usual,"

Team Roles

- Platform Champion / Product Owner



- Product Manager

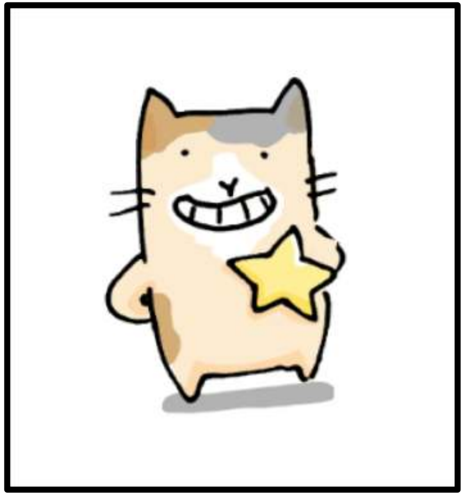


- Platform Engineers

Platform Champion / Product Owner

The Platform Champion has the **will** and the **political capital** to **protect** the platform team as they embark on the platform journey. A part time member of the platform team, the platform champion creates an environment where change can happen.

- Is often at – or close to – CxO level
- Has a track record of internal **entrepreneurship** or organizational **transformation**
- Changes conversations from "here's why this won't work" to "how can we make this work?"
- Understands and can articulate the value of a platform product and **evangelizes** its use and growth within your company through storytelling, air cover and recruitment

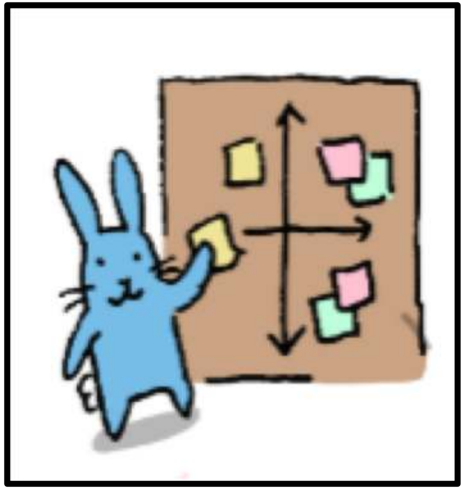


Thanks to @deniseyu21

Product Manager

The Platform Product Manager defines **what** should be done **rather than how** it should be done. A **full time member** of the platform team, the platform product manager defines the product strategy, manages the feature backlog with data-driven decisions and drives lean validation of assumptions and features.

- The "**dreamer**" who asks "why?" and doesn't allow themselves to be constrained by legacy thinking and processes
- The "**alchemist**" who can take lots of disparate "requirements" and distill them down to a succinct product vision
- The "**influencer**" who has strong relationships with business partners, application teams, and IT
- The "**minimalist**" who understands the value of shipping early and often
- The "**lean champion**" who relentlessly pursues process change

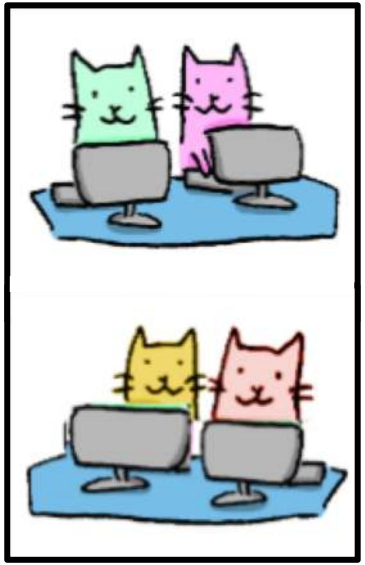


Thanks to @deniseyu21

Platform Engineers

The Platform Engineering team requires a combination of infrastructure and software engineering skills. Because SRE treats operations as if it is a software problem, your **platform engineers should be able to code.**

- The **infrastructure architect who codes**: Very experienced in IaaS primitives this person usually has experience in production operations and naturally automates repetitive tasks
- The **natural automator**: You'll often find this person doing continuous integration and deployment (CI/CD) work, automating your current release management processes or doing system automation
- The **curious software engineer**: You'll find this person in an application product team which has previously solved its own platform needs by going down the stack to automate infrastructure



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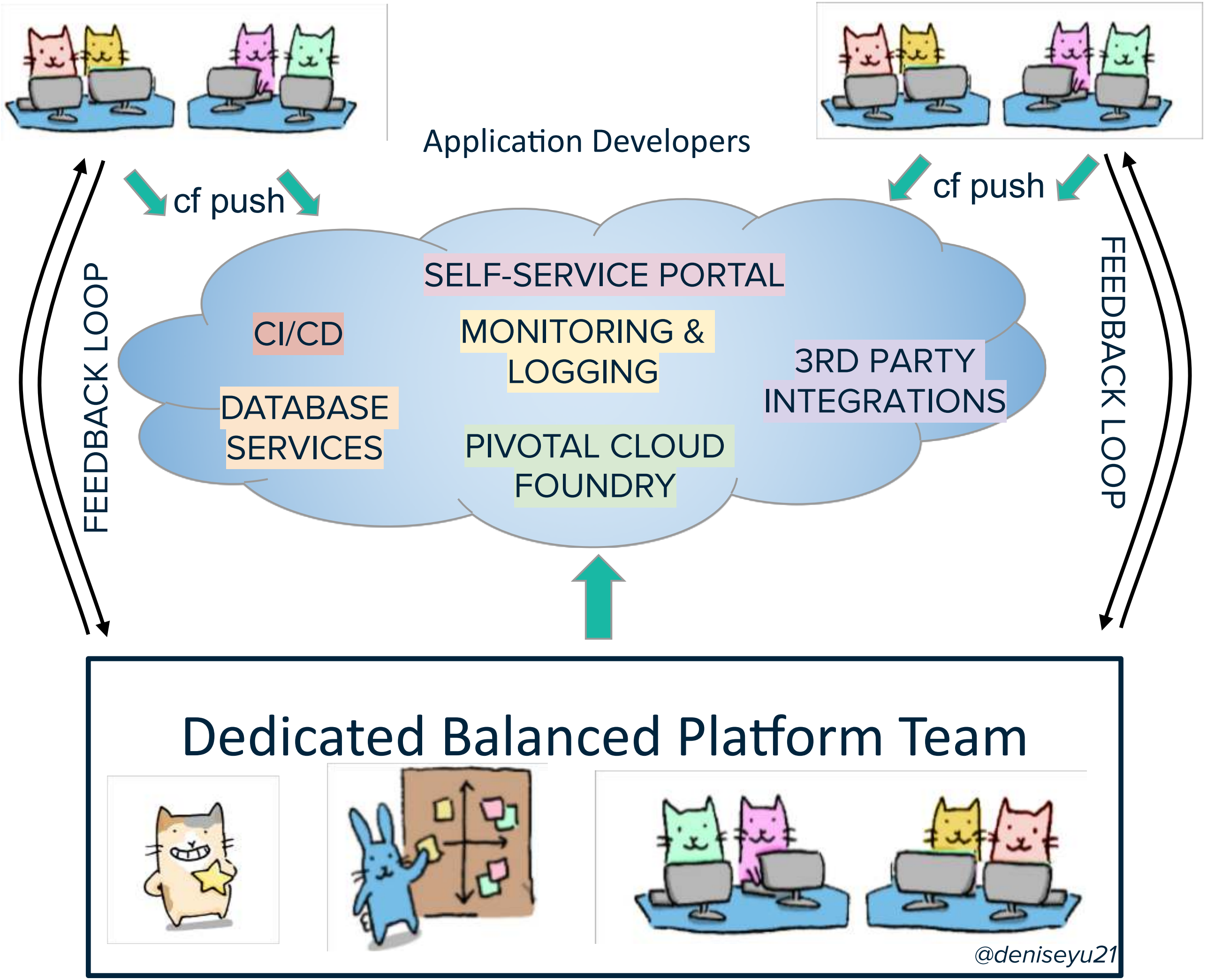


Application Developers

cf push

cf push

FEEDBACK LOOP

FEEDBACK LOOP

SELF-SERVICE PORTAL

CI/CD

MONITORING & LOGGING

3RD PARTY INTEGRATIONS

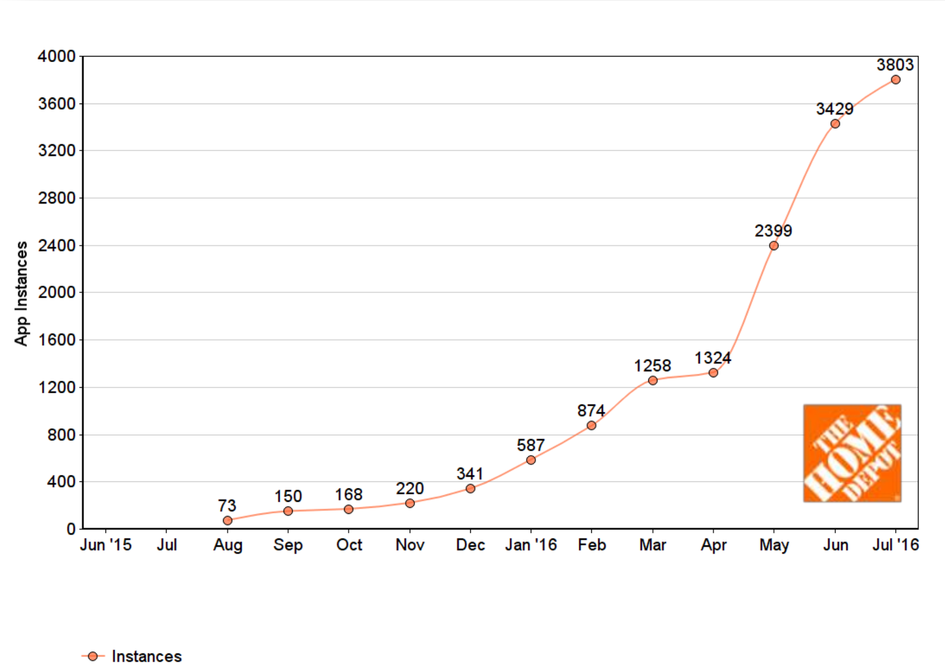
DATABASE SERVICES

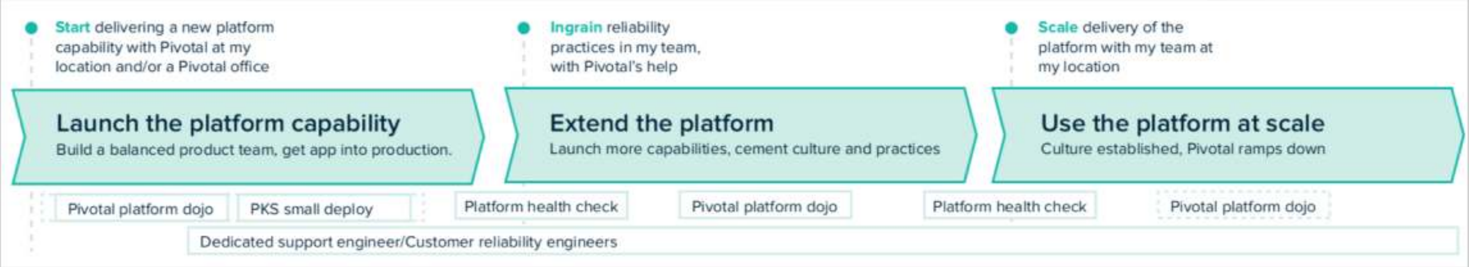
PIVOTAL CLOUD FOUNDRY

Dedicated Balanced Platform Team

@deniseyu21

Rolling it out, ongoing management





Start delivering a new platform capability with Pivotal at my location and/or a Pivotal office

Ingrain reliability practices in my team, with Pivotal's help

Scale delivery of the platform with my team at my location

Launch the platform capability
Build a balanced product team, get app into production.

Extend the platform
Launch more capabilities, cement culture and practices

Use the platform at scale
Culture established, Pivotal ramps down

Pivotal platform dojo

PKS small deploy

Platform health check

Pivotal platform dojo

Platform health check

Pivotal platform dojo

Dedicated support engineer/Customer reliability engineers

Sources: Home Depot meetup, Oct 2015; Humana at CF Summit 2015; "Getting started," Coté, Oct 2016; Comcast's Christopher Tretina at SP1 2016; "Cloud-Native at Home Depot, With Tony McCulley"; "Bottom Up Enterprise Transformation," Kyle Campos, CSAA Insurance, CF Summit EU, Oct 2017. Number of AI's equates to ~130 apps composed on ~900 services.

Budget for initial consulting

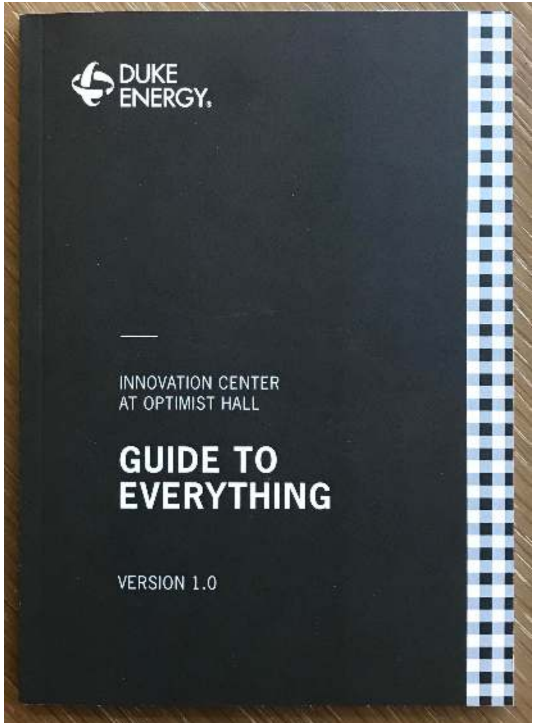
Organizational Learning

- Spend lots of time initially working with product teams
- You’re often the most qualified to know the platform and even how to program for it
- Budget this time and staffing in, don’t get shocked by actuals versus long-term dev:ops ratios.

Pivotal

Sources: "Take DevOps to 11 and Sprinkle Cloud on it with Rainbows and Unicorns," Matt Curry, s1p 2017; customer discussions.

Labs, factories, CoE's, whatever...but brand your platform



- It's important to make a brand, this is a product.
- Internal conference, training, etc.
- Stickers & t-shirts, even!

Sources: brands from Allstate, Talanx, Duke Energy.

What does a successful platform product look like?

Strong Executive Sponsorship with a well communicated vision

A Fully Dedicated and Balanced Team
(Product Owner/Product Manager, Platform Engineers)

Empowered to:

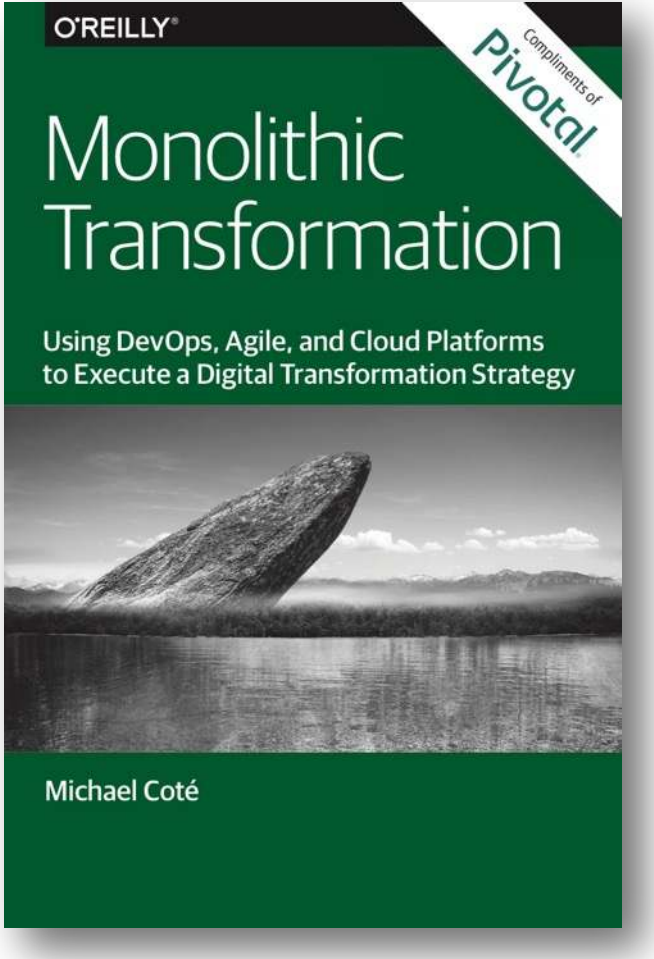
- Define Product Strategy
- Prioritize Backlog
- Release Updates & Patches to Platform
- Challenge Legacy Processes
- Focus on Reliability

By:

- Speaking Directly to Developers
- Conducting Hypothesis Driven Experiments
- Using Quick Feedback Loops
- Making Metric Driven Decisions

Resulting In:

- Solutions to Real Business & Customer Problems
- Minimizing Waste
- Increased Velocity
- Maximized ROI
- Good Product/Market Fit



O'REILLY

Compliments of Pivotal

Monolithic Transformation

Using DevOps, Agile, and Cloud Platforms to Execute a Digital Transformation Strategy

Michael Coté

http://cote.coffee/bettersoftware/

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