

Cloud Native Applications

Microservice Architectures in the Enterprise

Christian Lewis
Platform Architect – Pivotal
clewis@pivotal.io
[@acrlewis](https://twitter.com/acrlewis)
[Linkedin.com/in/christianlewis](https://www.linkedin.com/in/christianlewis)

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Monolithic Applications Drive Complex, Manual Deploys & Waterfall Release Cycles

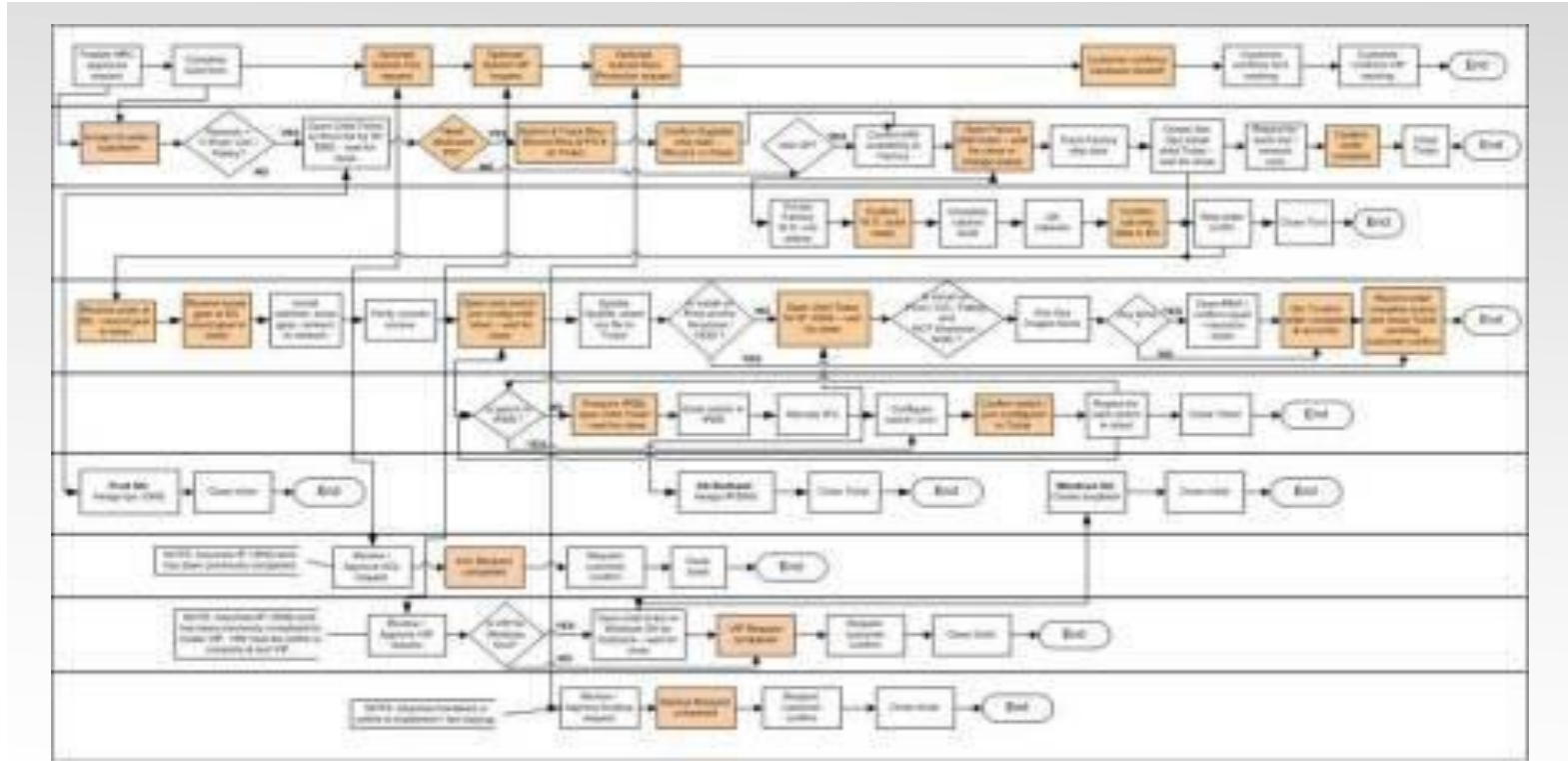
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Developer



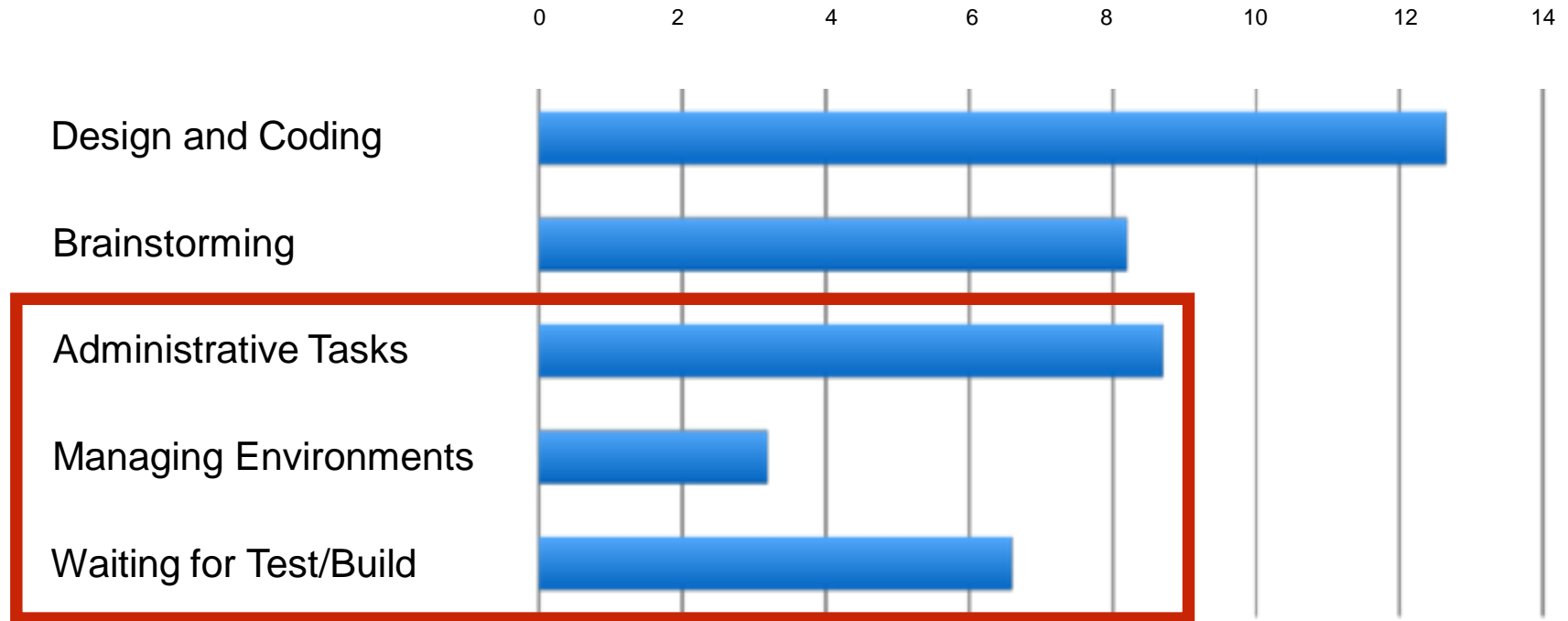
Operator



Can you deliver full CI/CD for every major app in your portfolio today, or are you doing 75+ step manual deployments?

Productivity: Software developers spend too much time on administration

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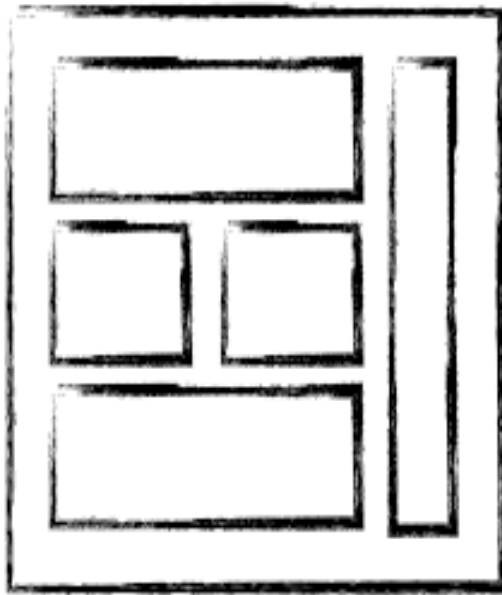
Task Breakdown

Average Hours / Week

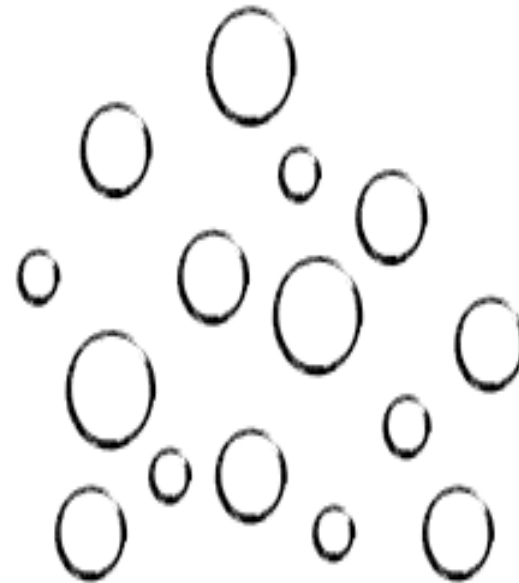
Trend towards new lightweight architectures

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Microservices addressing speed to market and cloud scale



MONOLITHIC/LAYERED



MICRO SERVICES

What are Microservices?

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If every service has to be updated in concert, it's not loosely coupled!

Loosely coupled service oriented
architecture with bounded contexts

If you have to know about surrounding services you don't have a bounded context.

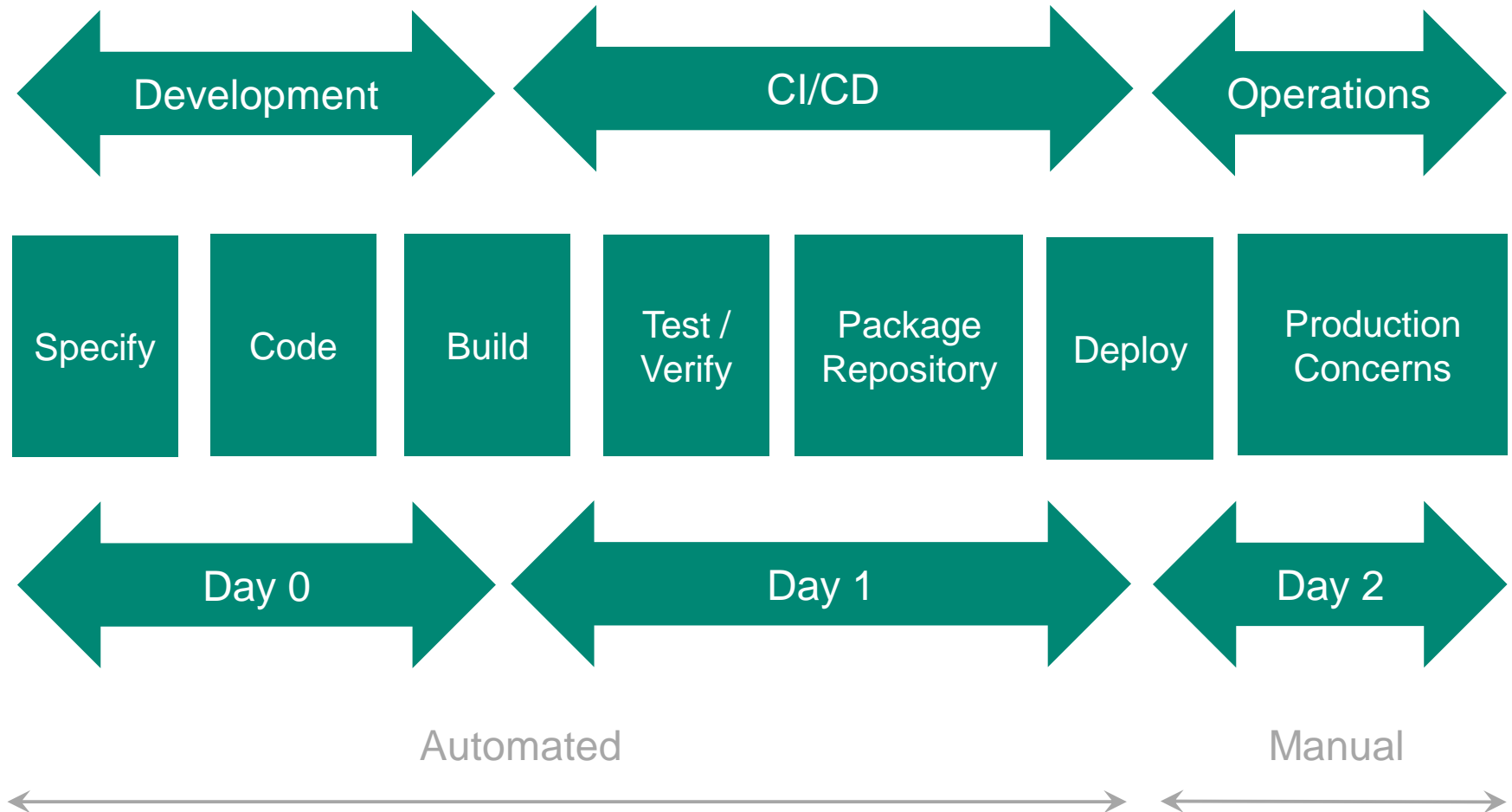
Both speed and safety are required

- Addressing customer needs faster, with less downtime retains your customers
- Being able to make quick experiments (that aren't destabilizing) gives you more chances at success
- Protecting market share from disruptors or something unforeseen
- The first to successfully rollout the innovation tends to win, defines the category



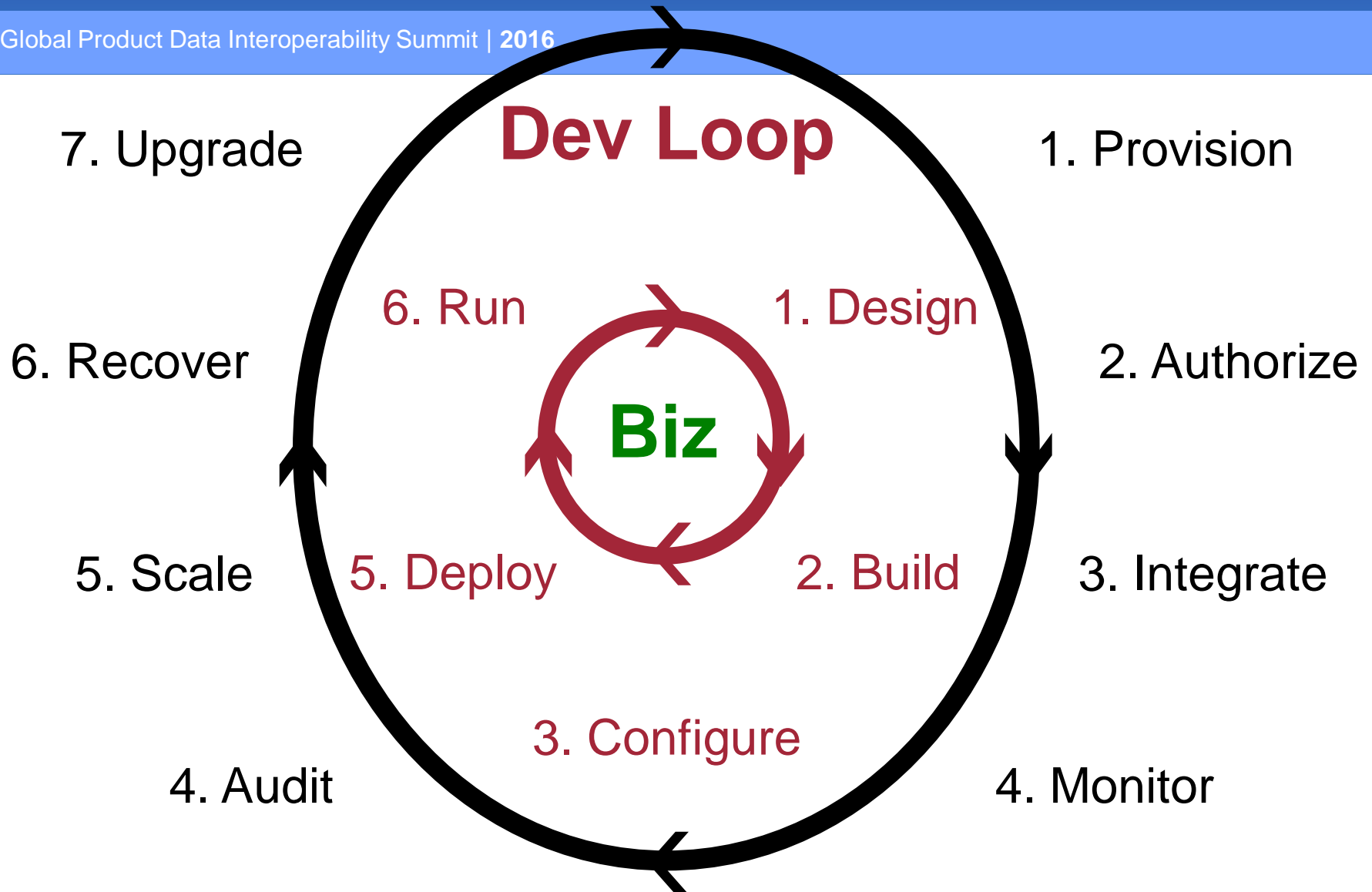
Continuous Delivery

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Ops Loop

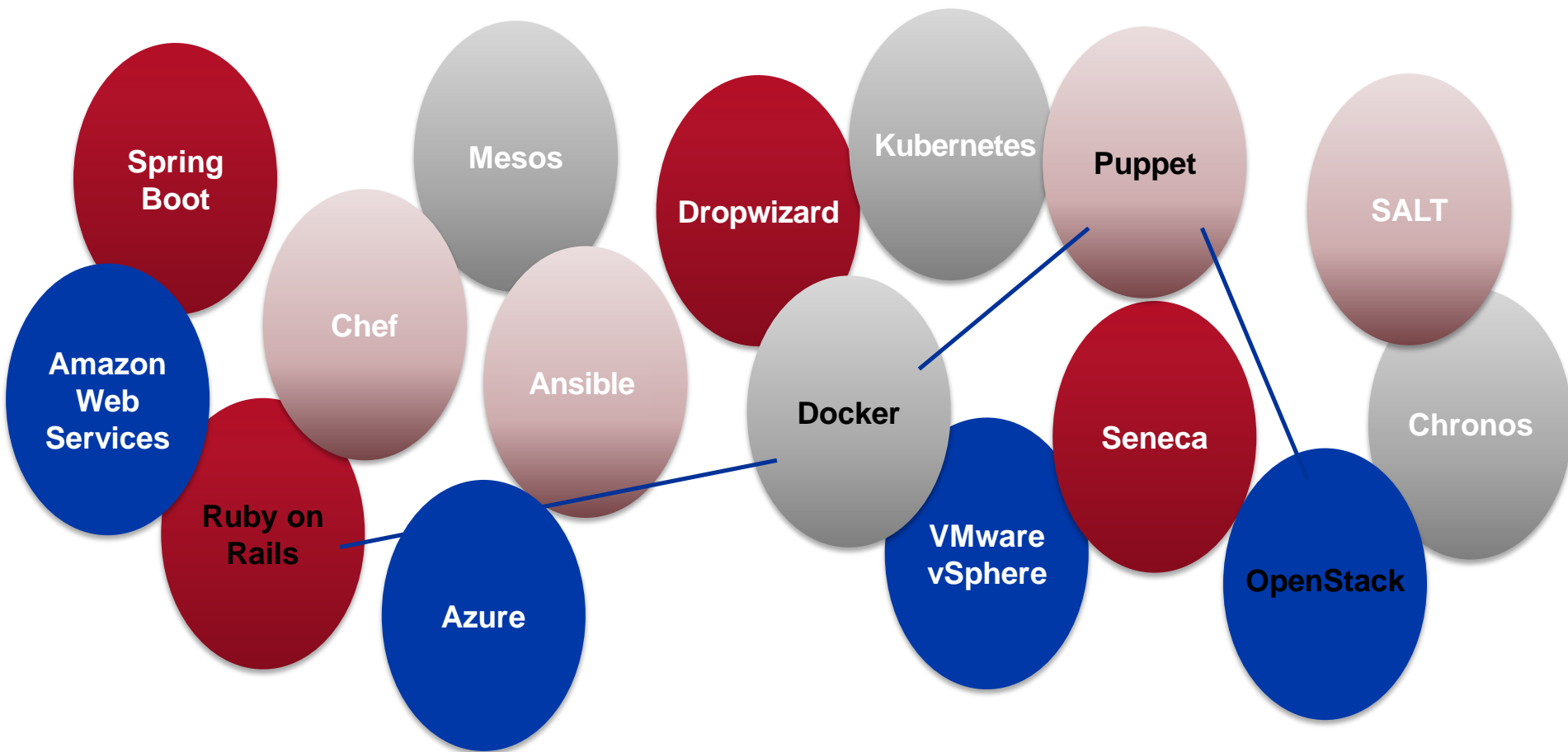
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Cloud Technology Bingo

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Cloud adoption with non-cloud native applications, unopinionated tools and adhoc automation



Application
Frameworks

Container
Schedulers

Automation
Tools

Cloud
Infrastructure

Cloud Technology Stack

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Dev

Application Framework

Language framework for microservice-based architectures including components for service discovery, metrics and circuit breakers.



Spring
Boot



Spring
Cloud



Contract: **12 Factor Application**



Dev



Ops

Platform Runtime

Application container runtime with attachable backing services, automated CI/CD, routing, health management and logging.



Pivotal
Cloud Foundry

Contract: **BOSH Release**



Ops

Infrastructure Automation

A single deployment API for provisioning for bit-for-bit, consistent, self-healing deployments across any private or public cloud.



BOSH



Pivotal
Cloud Foundry

Platform Runtime

Routing

Container Scheduling

Service Discovery

Configuration

Application Framework

12 Factor Apps

Microservices

RESTful
Services

Circuit Breakers

Spring Boot

Ruby on Rails

Node.js

.NET

Logging & Metrics

Messaging

Services

Database

Big Data

Object Storage

Mobile

Build CI

User Provided

Operations

Zero Downtime
Deployments

Failover &
Recovery

Scaling

Security
Patching

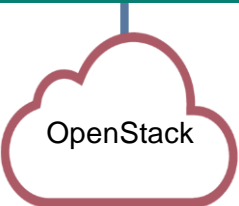
Platform
Upgrades

Infrastructure

VMware

OpenStack

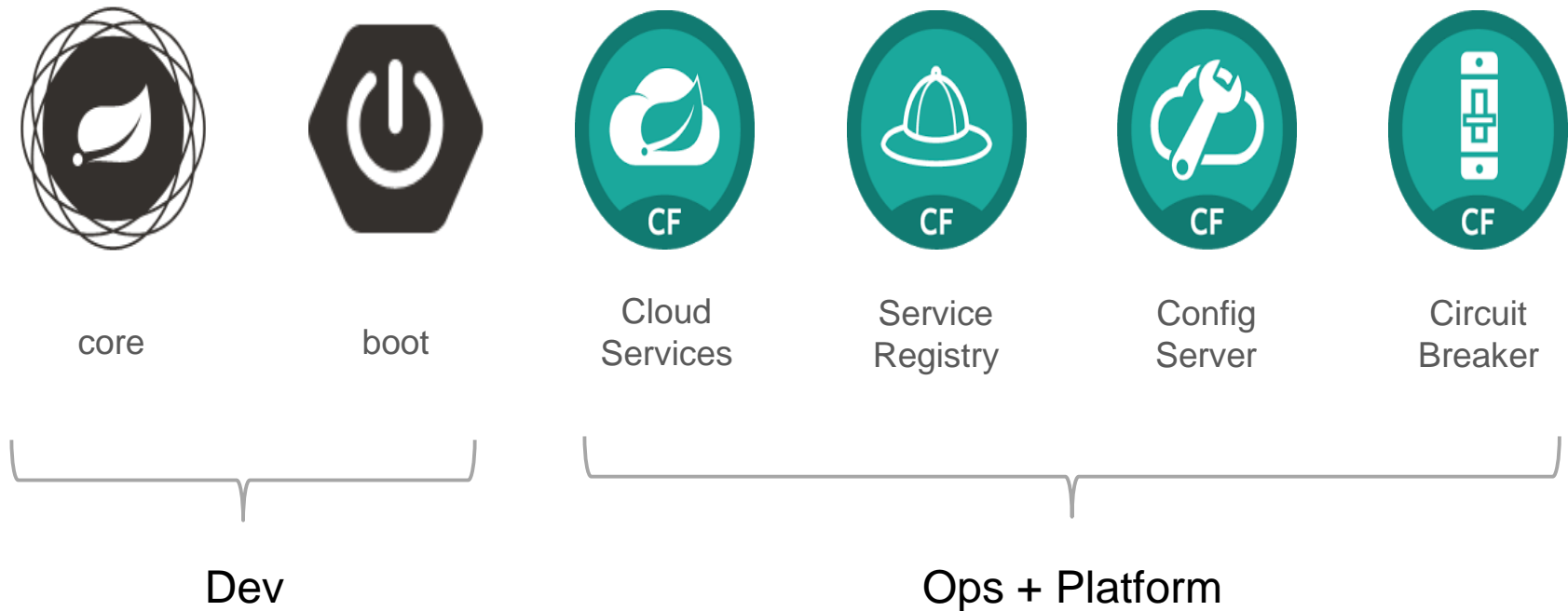
Amazon



Spring Cloud Services

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Rich, production ready library based on Netflix OSS for cloud native components, security and management.



Cloud Native Maturity Model

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Cloud Native

- Microservices architecture
- API-first design

Cloud Resilient

- Fault-tolerant and resilient design
- Cloud-agnostic runtime implementation
- Bundled metrics and monitoring
- Proactive failure testing

Cloud Friendly

- 12 Factor App methodology
- Horizontally scalable
- Leverages platform for high availability

Cloud Ready

- No permanent disk access
- Self-contained application
- Platform-managed ports and networking
- Consumes platform-managed backing services

The Cloud Native Journey

Cloud Native

- Believer in opinionated platforms, enforcing cloud-native design
- Shipping microservices with full CI/CD, automated lifecycle management
- Struggling with modernizing applications, reskilling

Containers

- Believer in reproducible builds, operational visibility, open-source
- Shipping a container runtime, microservices, automated provisioning
- Struggling with adhoc operations, manual CI/CD, unintegrated tools, curating OSS

DevOps

- Believer in automation, opinionated software, microservices, 12 Factor
- Shipping API-first applications,
- Struggling with adhoc operations, lack of tooling and monitoring, security

Agile

- Believer in agile, speed to market, software as a differentiator
- Shipping greenfield projects in public cloud because on-premise is too slow
- Struggling with CI/CD, provisioning environments, lack of operational visibility

Traditional

- Believer in IT as a cost center, large projects, customizing off-the-shelf software
- Shipping completed software projects
- Struggling with failed projects, long lead times, business advantages of software

Traditional Model

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- **Discovery:** huge issue: mostly custom solutions, JNDI, etc.
- **Configuration:** manual, error-prone, required app restarts
- **Dependencies & Resilience:** co-bundling, EJBs, complex
- **Operators:** no standardized process for deployment and management
- **Developers:** low productivity due to complex environments and expensive context switching

Microservice Model

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- **Discovery:** Service registry for discovery and credentials
- **Configuration:** Config server for secure, versioned application configuration and updates
- **Dependencies & Resilience:** Circuit breakers, platform services marketplace and 4 layers of health monitoring
- **Operators:** Structured deployment model with a single API to manage operations tasks such as deploys and scaling.
- **Developers:** Rich library of distributed system patterns

Traditional App Environment



Load Balancer



Web Server



App Server



Database



ERP

Rehost, Refactor & Rearchitect Strategies

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Platform Runtime



API
Gateway



Microservice
App



12 Factor
App

BOSH VMs



App
Server

Backing Services



Database



Dynamic
Router



Service
Discovery

Off Platform



ERP

Looking to incubate a cloud native application model?

Application Framework
+
Platform Runtime
+
Infrastructure Automation

Complementary O'Reilly Book
<http://bit.ly/cloud-native-book>

