Pivotal Summit 2019

The Evolution of a Platform

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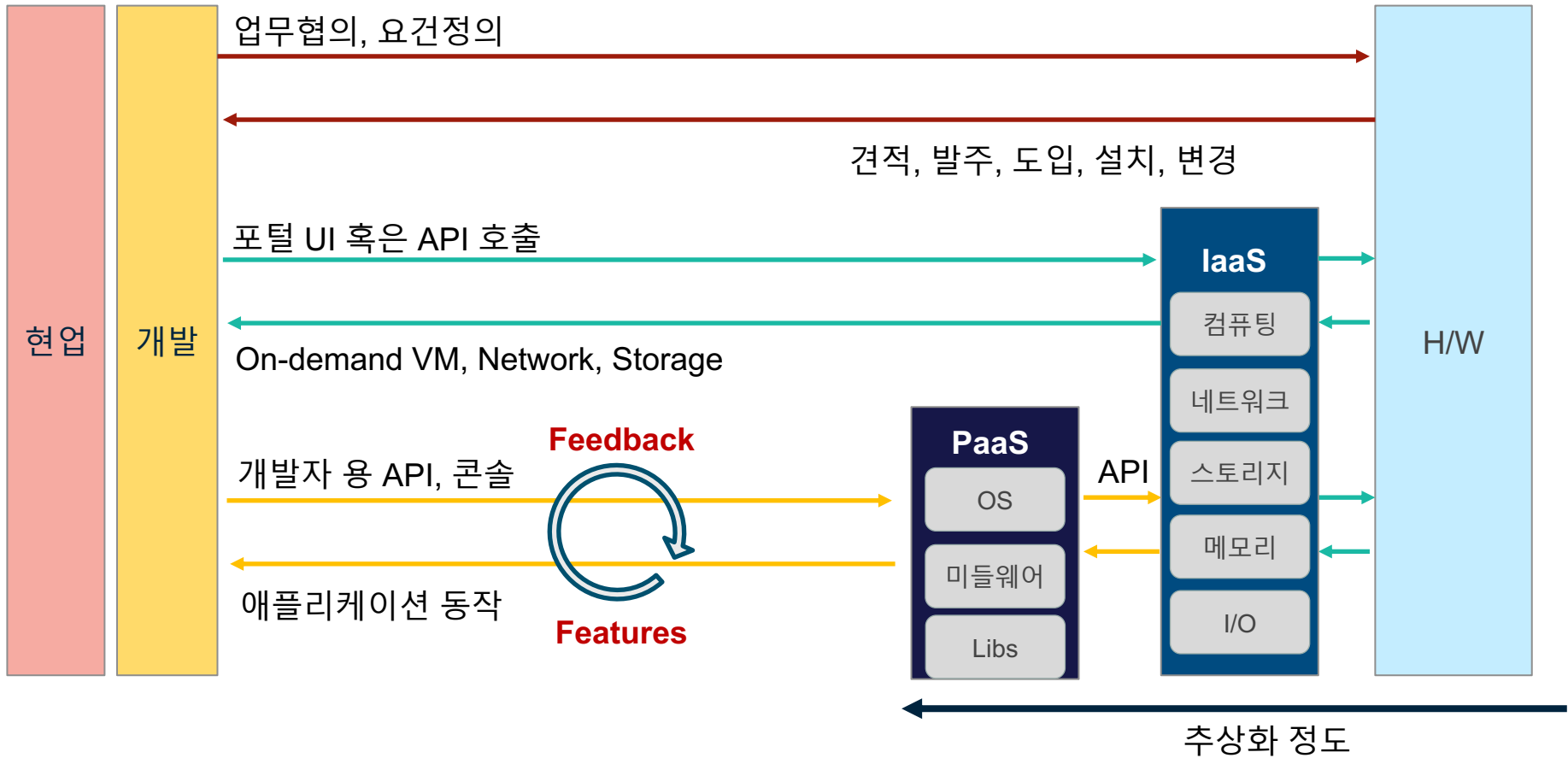November 19, 2019
Amoris Hall, GS Tower
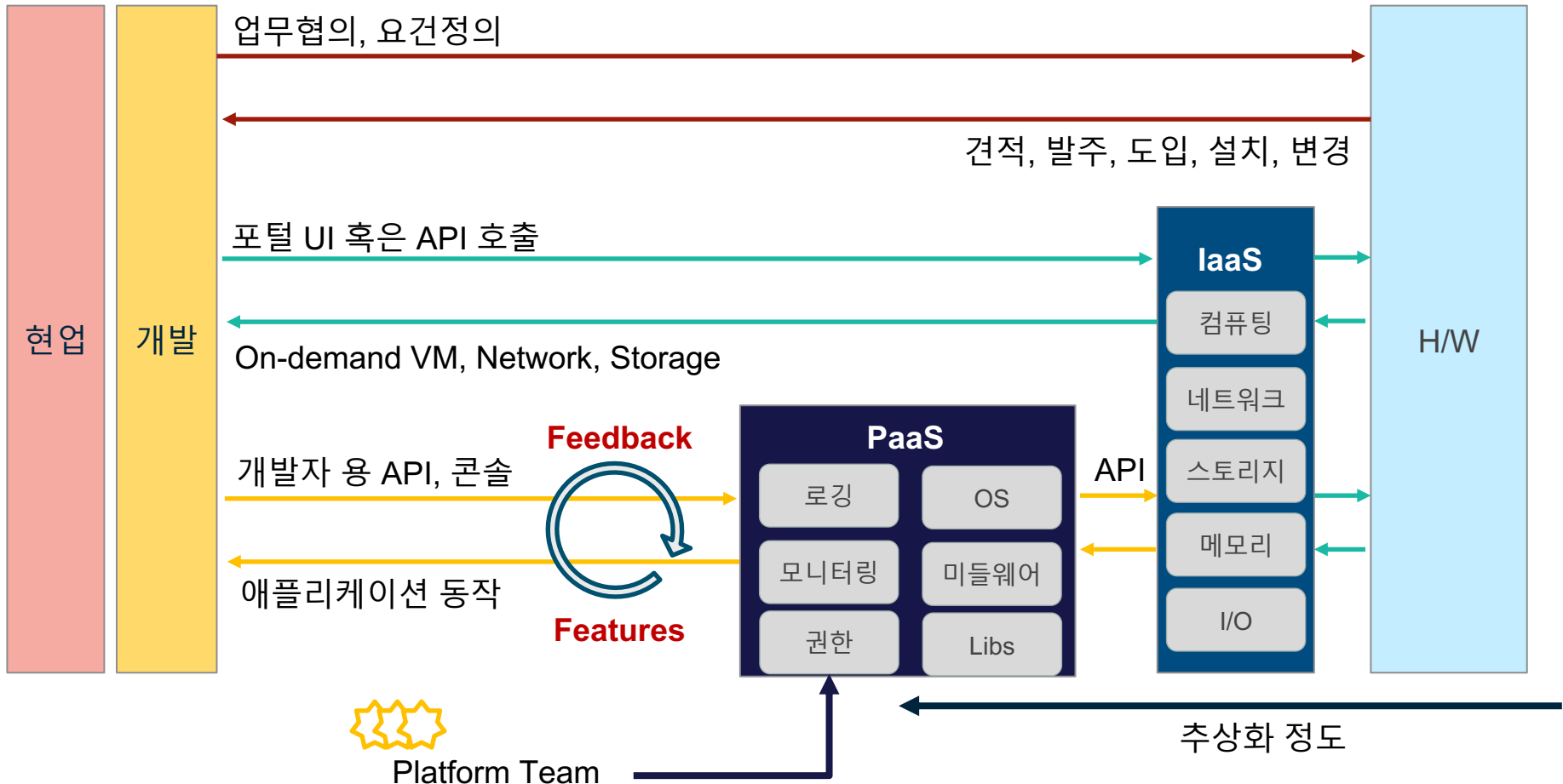
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Agenda

- What is Platform?
- 3 Key Points
    - Kubernetes First
    - Modularized Components
    - Standardized Marketplace
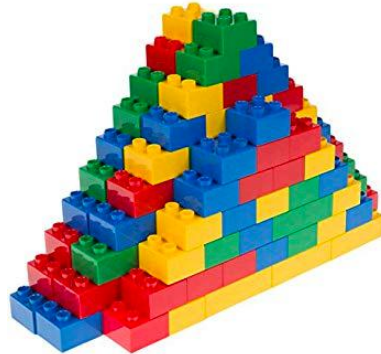- Confluent Platform

What is Platform?

Three Key Points

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1 Kubernetes First
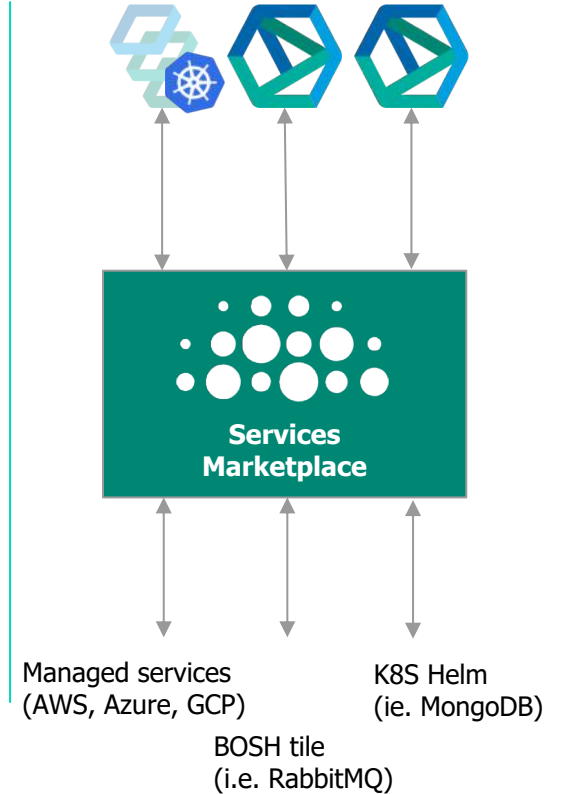

2 Modularized Components

3 Standardized Marketplace

Services Marketplace

Managed services
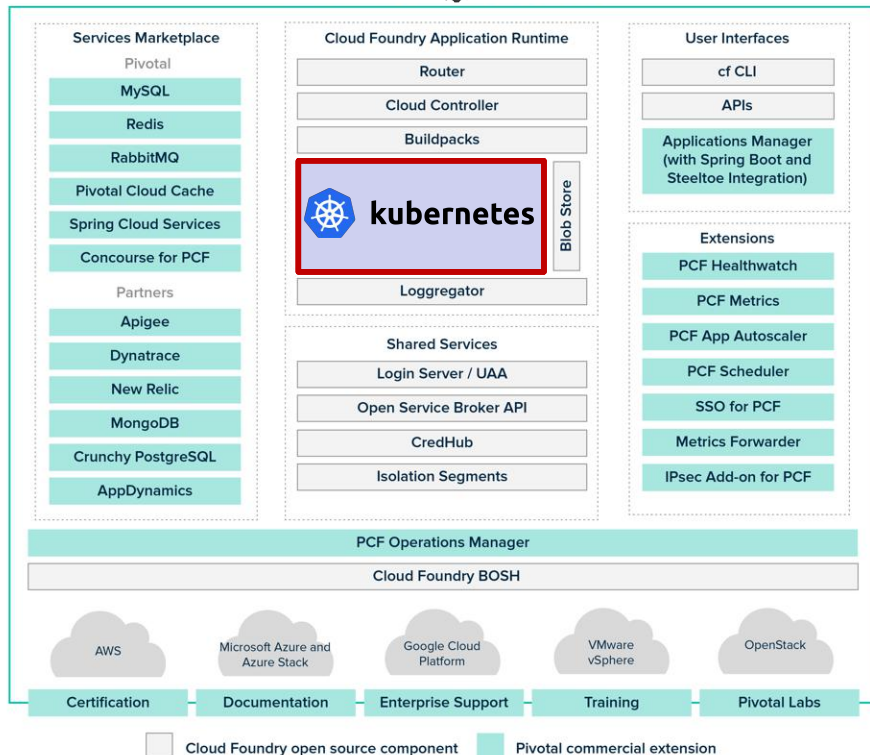(AWS, Azure, GCP)

BOSH tile
(i.e. RabbitMQ)

K8S Helm
(ie. MongoDB)

1 Kubernetes First

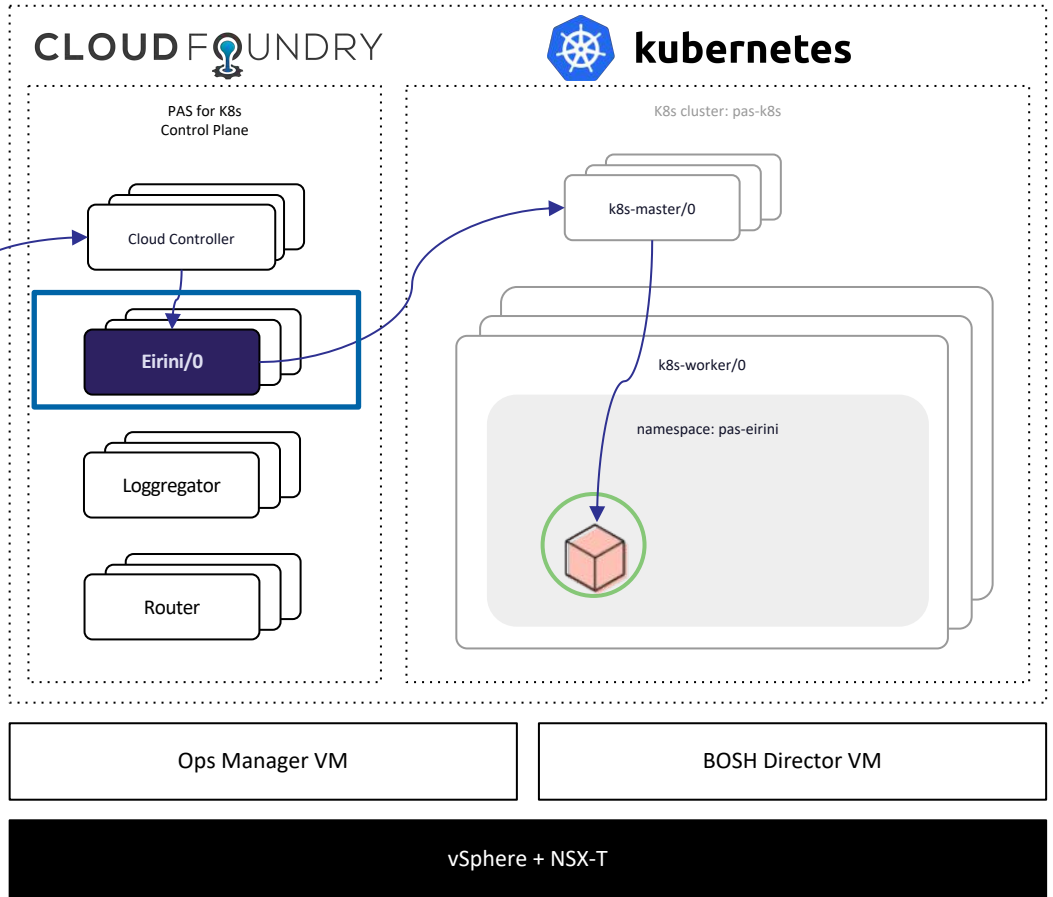Kubernetes는 플랫폼을 만들기 위한

"시작 점"에 불과하다.

Cody
Application Developer

```
$ cf push myApp

$ cf logs myApp

$ cf scale myApp -i 5
```

Alana
Platform
Engineer

```
$ kubectl get pods -n pas-eirini
```

CLOUD FOUNDRY

kubernetes

PAS for K8s
Control Plane

K8s cluster: pas-k8s

Cloud Controller

k8s-master/0

Eirini/0

k8s-worker/0

namespace: pas-eirini

Loggregator

Router

Ops Manager VM

BOSH Director VM

vSphere + NSX-T

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2 Modularized Components

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Modularized Components

Pivotal **Application Service**

Pivotal **Container Service**

Securely assemble, deploy, and update code	Use supported Java, Spring and Tomcat	Execute functions in response to events	Get observability and routing as a managed service	Monitoring Logging User/Role Manage
Pivotal **Build Service**	Pivotal **Spring Runtime**	Pivotal **Function Service**	Pivotal **Ingress Router**	Pivotal **App Service**

kubernetes

HARBOR

CLOUD FOUNDRY **BOSH**

vmware **NSX-T**

vmware Azure Google Cloud Platform aws openstack

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More Flexibility

More Efficiency

2-1 Pivotal **Build Service**

2-2 Pivotal **Spring Runtime**

Pivotal **Function Service**

2-3 Pivotal **Ingress Router**
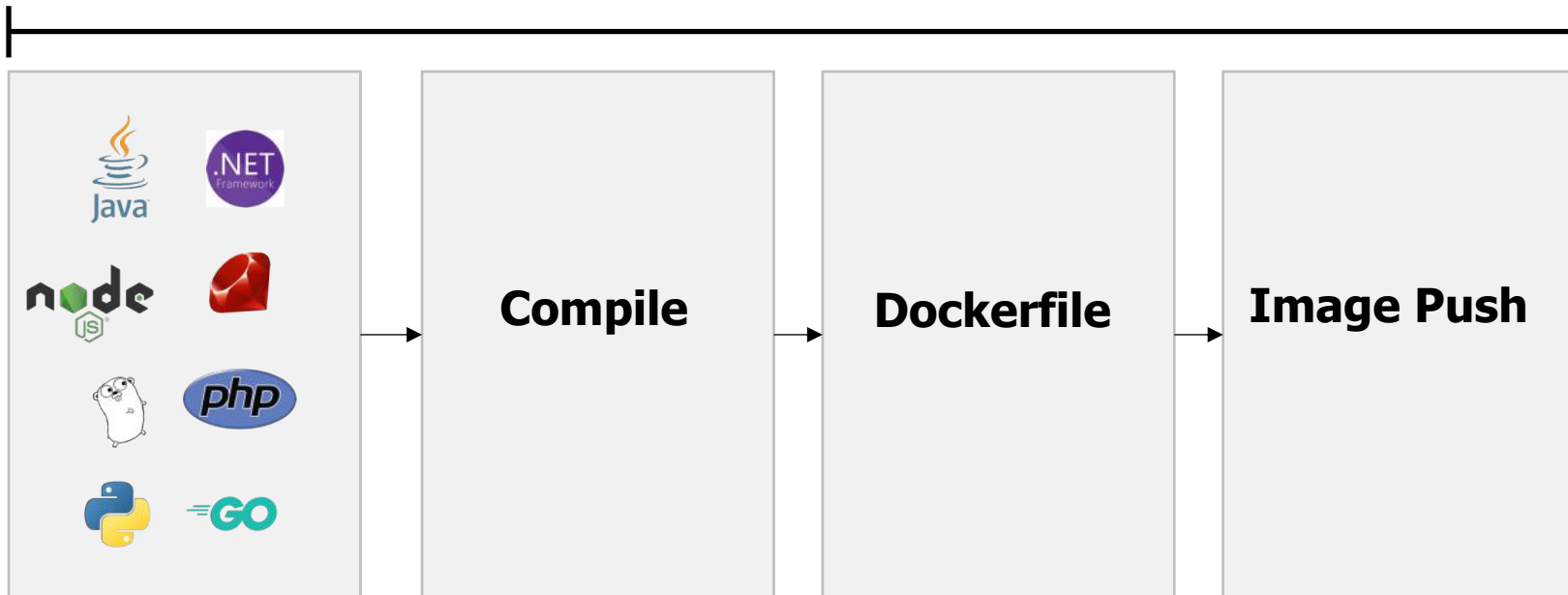
Pivotal **Services Marketplace**

✓ Option 1.

✓ Option 2.

Pivotal Container Service™

kubernetes

Pivotal Application Service™

Pivotal

Modularized Components

2-1 **Pivotal Build Service (PBS)**

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Source

Container Image

Compile → **Dockerfile** → **Image Push**

Buildpacks.io (Source to Image)

Compile

~~Dockerfile~~
Builder & Buildpack

App Code
APM JDBC Lib
Open JDK 1.8
Stack

Image Push

OCI Container Image
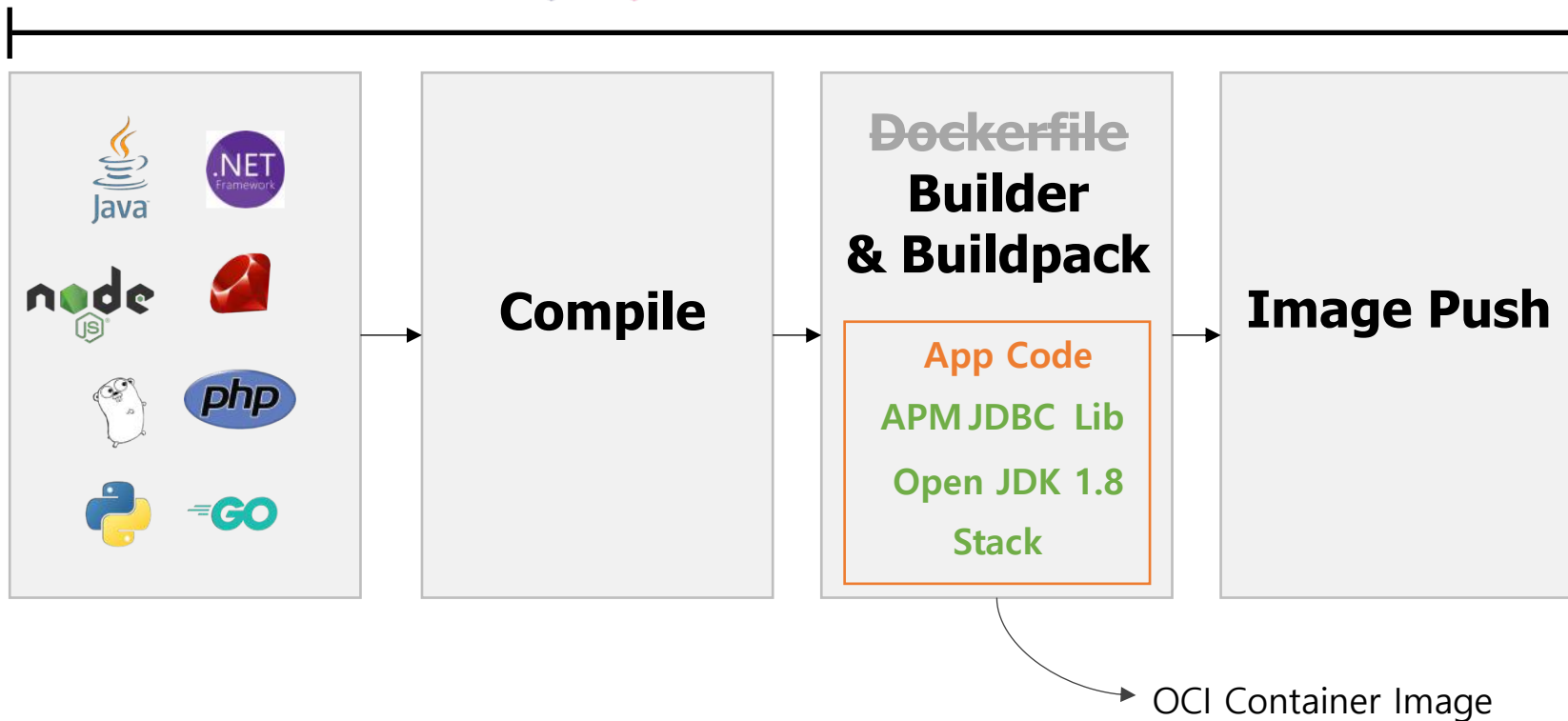
Build Service: How It Works

source:
git:
https://github.com/myapp
 revision: dev

consumes

openjdk CNB releases

```
v1.0.0-M7 released - Apr 10
v1.0.0-M6 released - Apr 1
v1.0.0-M5 released - Jan 31
v1.0.0-M4 released - Jan 16
v1.0.0-M3 released - Dec 10
v1.0.0-M2 released - Nov 29
```

consumes

cflinuxfs3 releases

```
0.92.0 released - 22 hours ago
0.91.0 released - 22 hours ago
0.90.0 released - 22 hours ago
0.89.0 released - 6 days ago
0.88.0 released - 9 days ago
0.87.0 released - 9 days ago
```

consumes

Build Service

builds

example.com/myapp/mytag

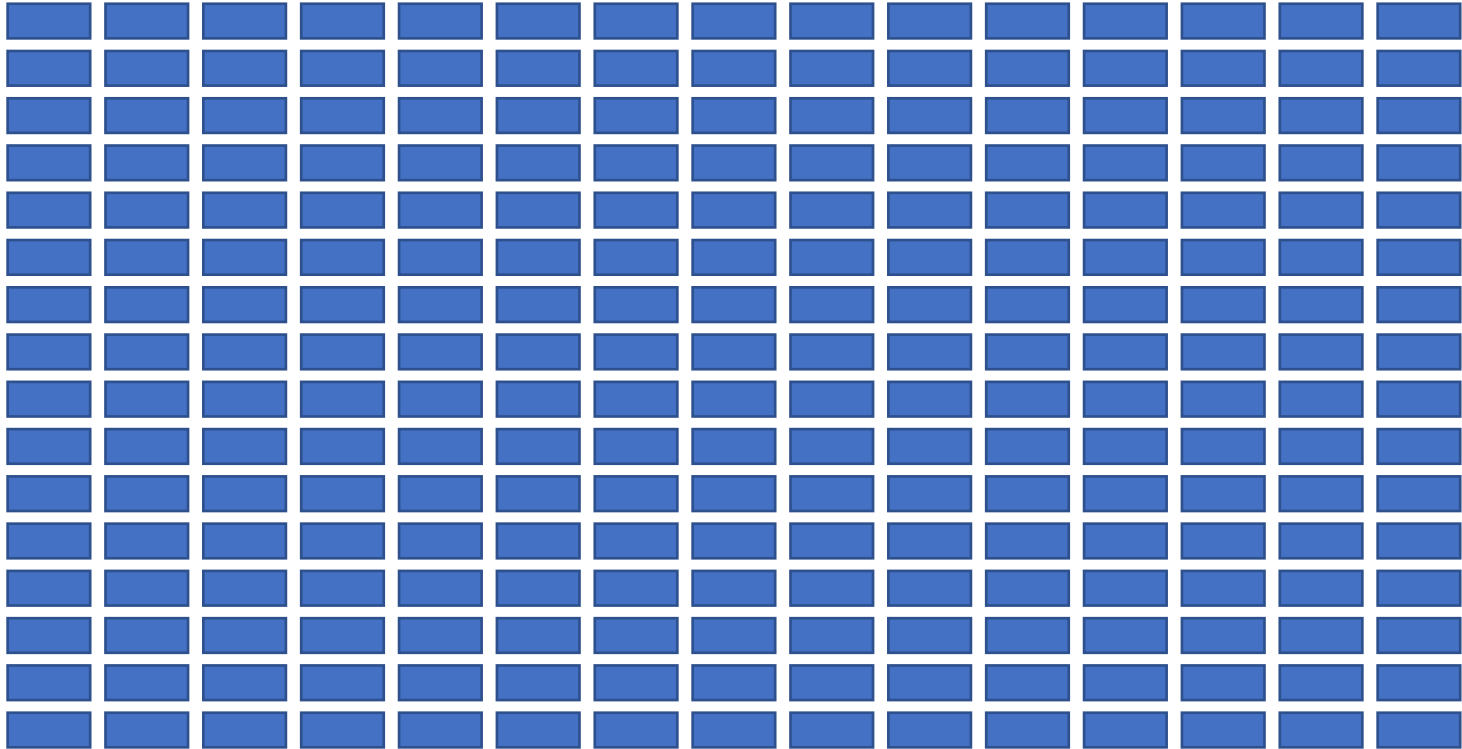| Latest Build |
| Build # 3 |
| Build # 2 |
| Build # 1 |

deploys
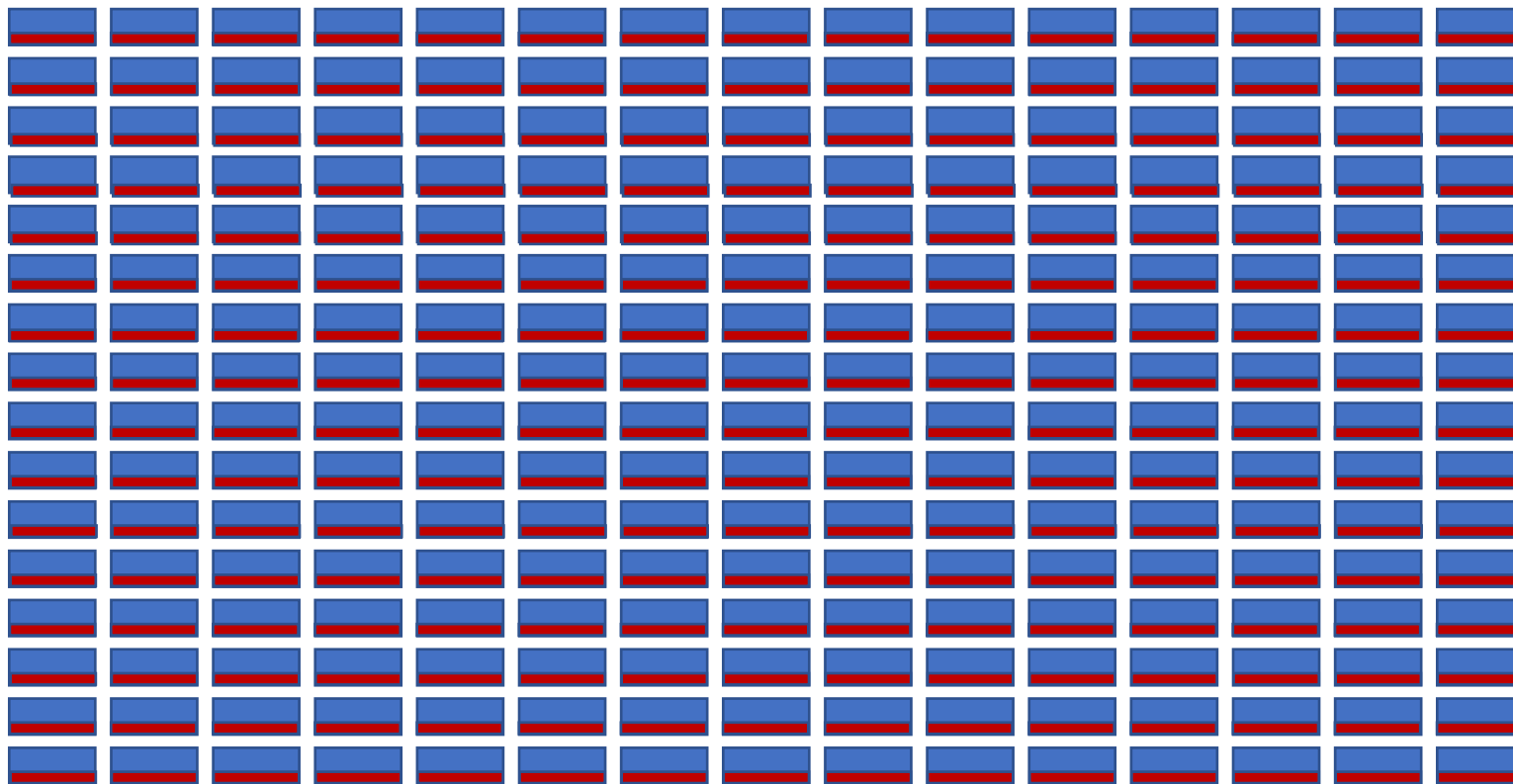
CI/CD Tools

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500 Different Apps

Pivotal

How to apply patches?

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Modularized Components

2-2 **Pivotal Spring Runtime**

Subscriptions Cover...

Binary Downloads

OpenJDK

Tomcat

Spring

All Updates & Upgrades

Premium Support

Global, 24x7 support

Fast response times

Docs, resources, knowledge-base

Spring – Binaries & Support for 40+ projects...

AspectJ	Spring Cloud Kubernetes	Spring Data for Apache Cassandra	Spring Kafka
Micrometer	Spring Cloud CLI	Spring Data Commons	Spring LDAP
Reactor	Spring Cloud OpenFeign	Spring Data KeyValue	Spring Kerberos
Spring AMQP	Spring Cloud Gateway	Spring Data LDAP	Spring REST Docs
Spring Batch	Spring Cloud Function	Spring Data JDBC	Spring Retry
Spring Boot	Spring Cloud Contract	Spring Data JPA	Spring Statemachine
Spring Cloud Commons	Spring Cloud Task	Spring Data MongoDB	Spring Security
Spring Cloud Config	Spring Cloud Stream	Spring Data GemFire	Spring Security OAuth
Spring Cloud Netflix	SCS Binder - Kafka	Spring Data for Apache Geode™	Spring Security SAML
Spring Cloud Bus	SCS Binder - RabbitMQ	Spring Data Redis	Spring Cloud Data Flow
Spring Cloud Cloud Foundry	SCS Binder - Kafka Streams	Spring Data REST	Spring Session
Spring Cloud Op.Sv.Broker	SCS Binder - AWS Kinesis	Spring Data Solr	Spring Vault
Spring Cloud Consul	Spring Cloud Vault	Spring Framework	Spring Cloud Skipper
Spring Cloud Security	Spring Tool Suite	Spring HATEOAS	Spring Shell
Spring Cloud Sleuth	Spring Tools 4	Spring Integration (Core modules + Kafka + AWS)	SC Stream/Task App Starters
Spring Cloud Zookeeper			

Most Popular Projects.
All Downloads from Maven Central
Official List of Supported Projects

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Tomcat **– Binaries & Support for 2 Versions…**

Pivotal TC Server

Built by Pivotal

Supported by Pivotal

Download from PivNet

Small Footprint

Enterprise Features

Advanced Session Replication

More details here…

Apache Tomcat

Built by Apache

Supported by Pivotal

Download from Apache

Pivotal

Modularized Components
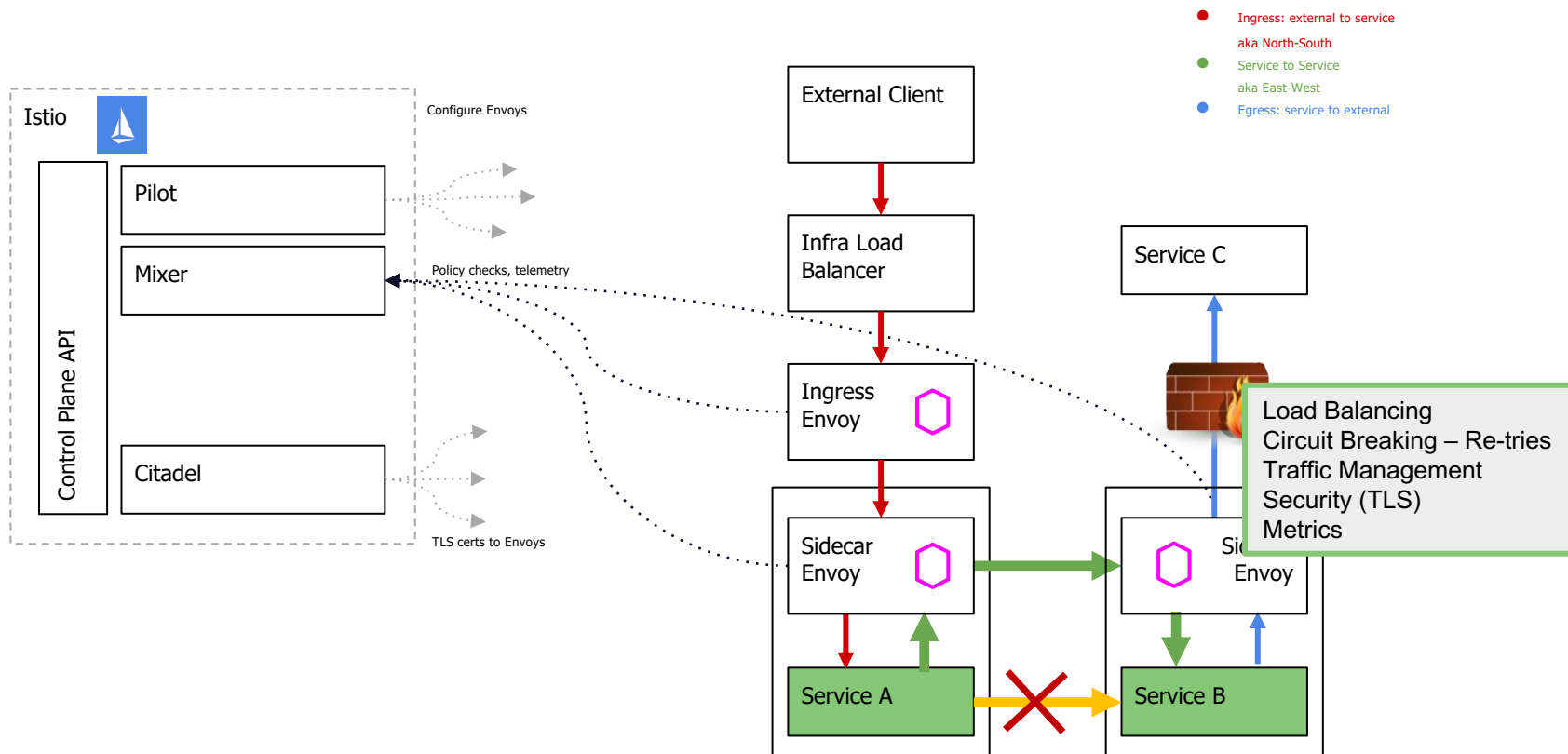
2-3 **Pivotal Ingress Router (Istio)**

Istio

GPS
Velocity
…

Application

Sidecar
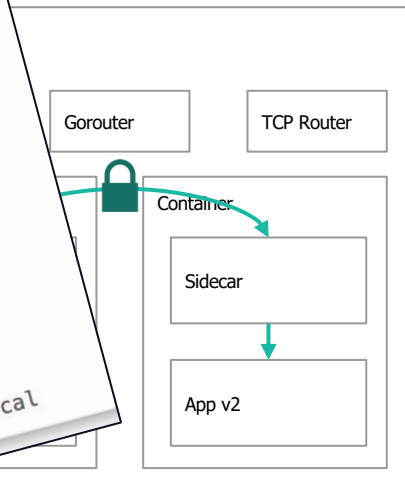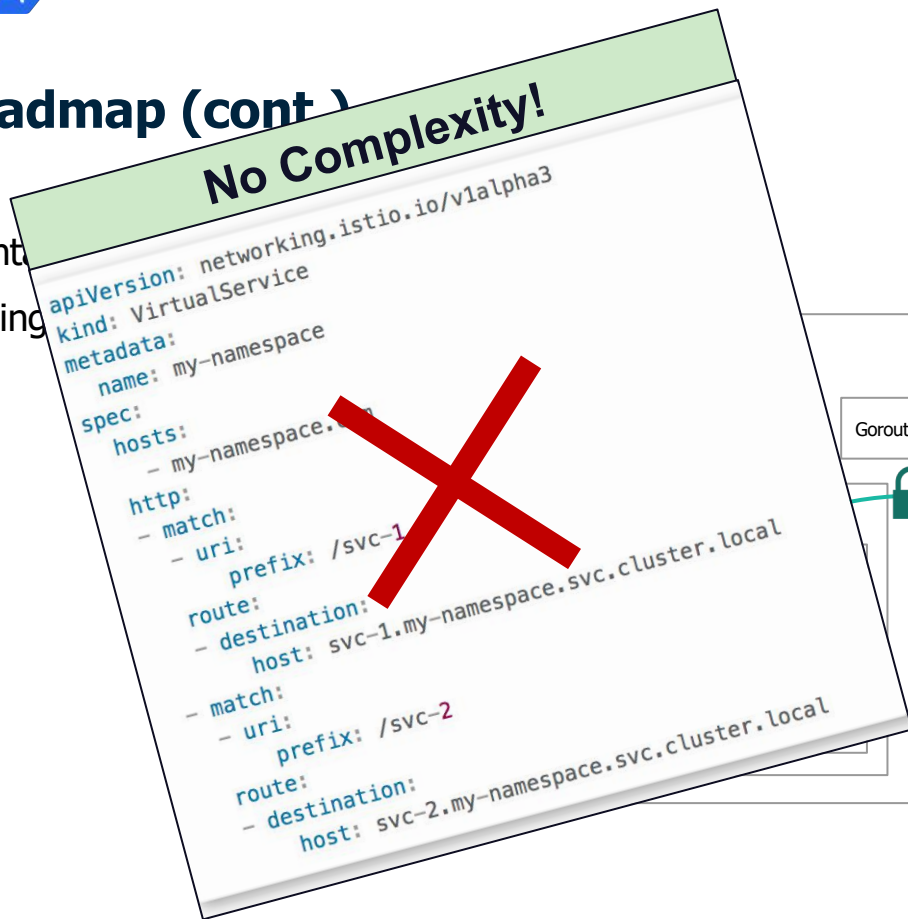
envoy

Envoy is the Proxy, Istio is the Control Plane

● Ingress: external to service
  aka North-South
● Service to Service
  aka East-West
● Egress: service to external

Istio

Control Plane API

Pilot

Mixer

Citadel

Configure Envoys

Policy checks, telemetry

TLS certs to Envoys

External Client

Infra Load Balancer

Ingress Envoy

Sidecar Envoy

Service A

Service C

Sidecar Envoy

Service B

Load Balancing
Circuit Breaking – Re-tries
Traffic Management
Security (TLS)
Metrics

Pivotal Ingress Router

- 클러스터 생성 시마다 DNS 설정 및 Load balancer 설정을 할 필요 없음
- Envoy를 이용하여 Ingress를 구현
- 멀티 클러스터를 엮어서 North-South 트래픽을 분배
- 각 클러스터의 마스터 노드로의 HTTP Routing
- 각 클러스터에 위치한 Pod로의 라우팅을 위해 TCP Routing
- 일반 K8S 환경 및 PKS에서 모두 활용 가능

Service Mesh ⎈ kubernetes
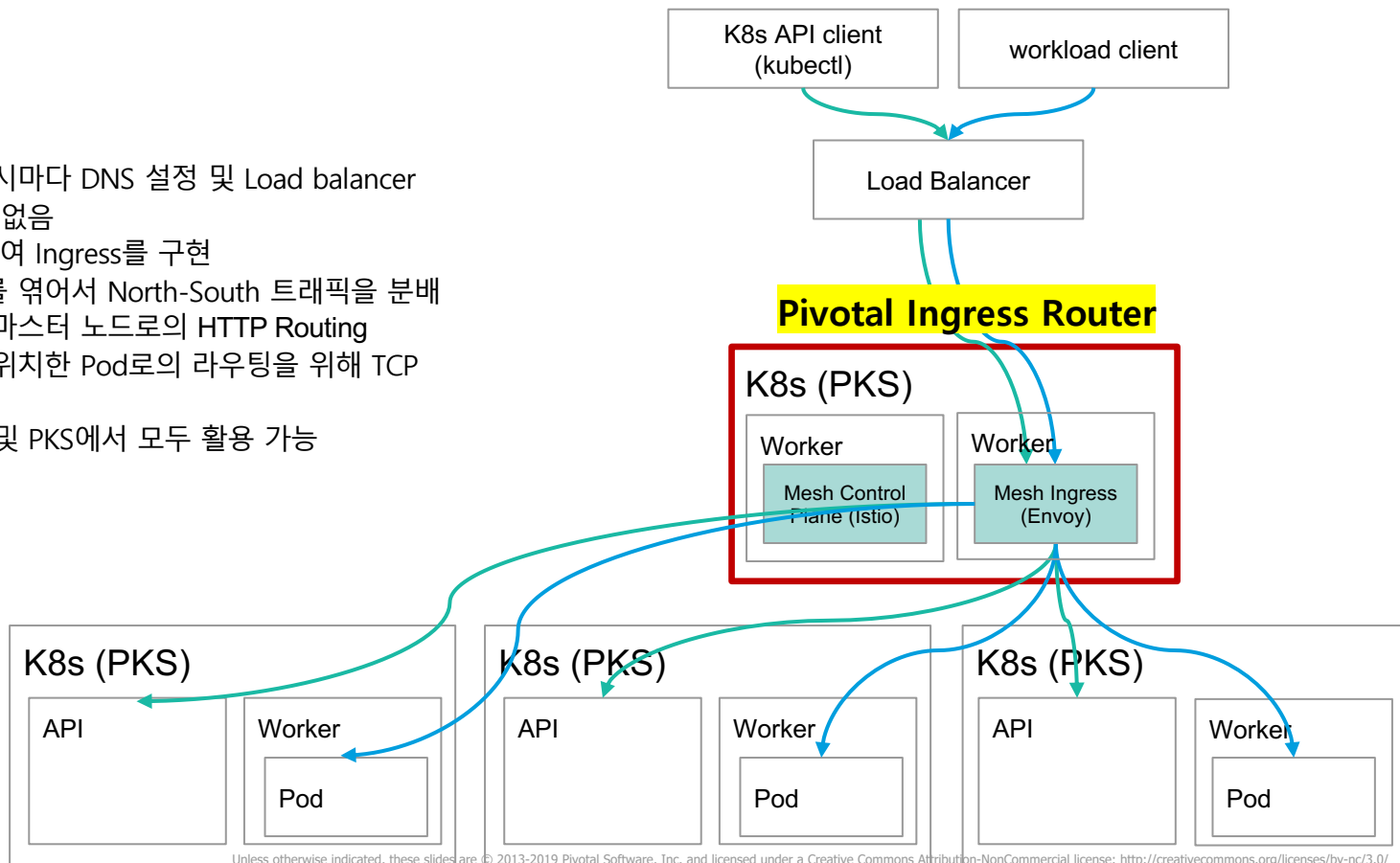
Service Mesh Roadmap (cont.)

- Service to Service (Cont...)
- Client-side load balancing
- mTLS by Default
- Traffic Management

No Complexity!

```
apiVersion: networking.istio.io/v1alpha3
kind: VirtualService
metadata:
  name: my-namespace
spec:
  hosts:
    - my-namespace...
  http:
    - match:
      - uri:
          prefix: /svc-1
      route:
        - destination:
            host: svc-1.my-namespace.svc.cluster.local
    - match:
      - uri:
          prefix: /svc-2
      route:
        - destination:
            host: svc-2.my-namespace.svc.cluster.local
```

Gorouter

TCP Router

Container

Sidecar

App v2

Pivotal.

3 Standardized Marketplace

https://network.pivotal.io/

and manage applications. The catalog includes solutions from Pivotal, our Partners, and the Cloud Foundry community providing a curated selection of capabilities from data ... Read more ∨

Most Viewed

MongoDB

Steeltoe

Pivotal Cloud Cache

Spring Cloud Services

Our Newest Additions

Spring Cloud Gateway

Pega Infinity

Datical

Instana Microservices Application

Filter: ❓ ◯ Compatible with PAS   ◯ Compatible with PKS   ◯ Compatible with Standalone PKS

Application Tier Networking & Gateway
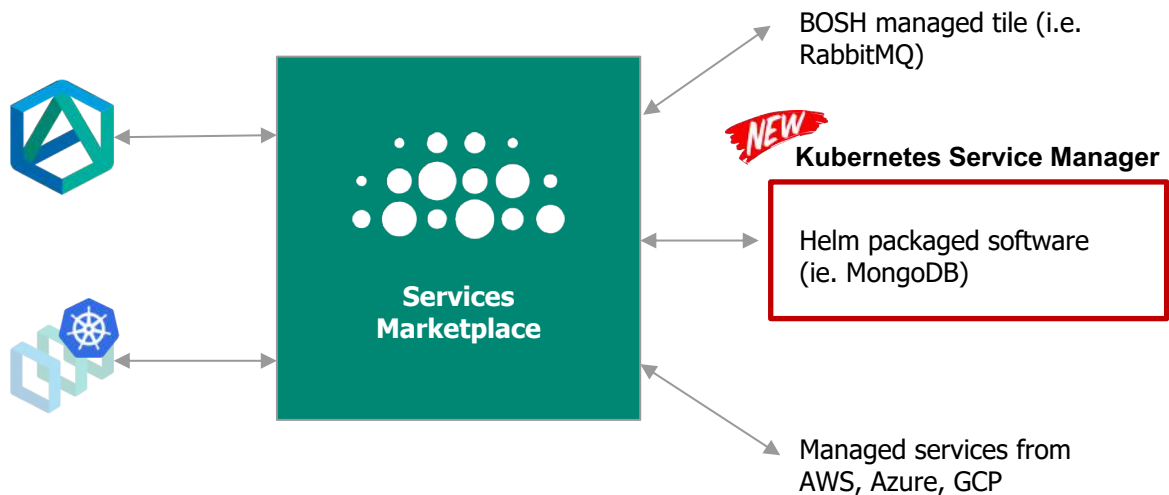
Manage traffic with route services and proxies.

Learn More

apigee Apigee   PARTNER

MuleSoft MuleSoft   PARTNER

Spring Cloud Gateway   PIVOTAL

WSO2 WSO2 API Manager   PARTNER

18F Secure Proxy   COMMUNITY

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A multi-platform services marketplace

____

BOSH managed tile (i.e. RabbitMQ)

NEW

Kubernetes Service Manager

Helm packaged software (ie. MongoDB)

Services Marketplace
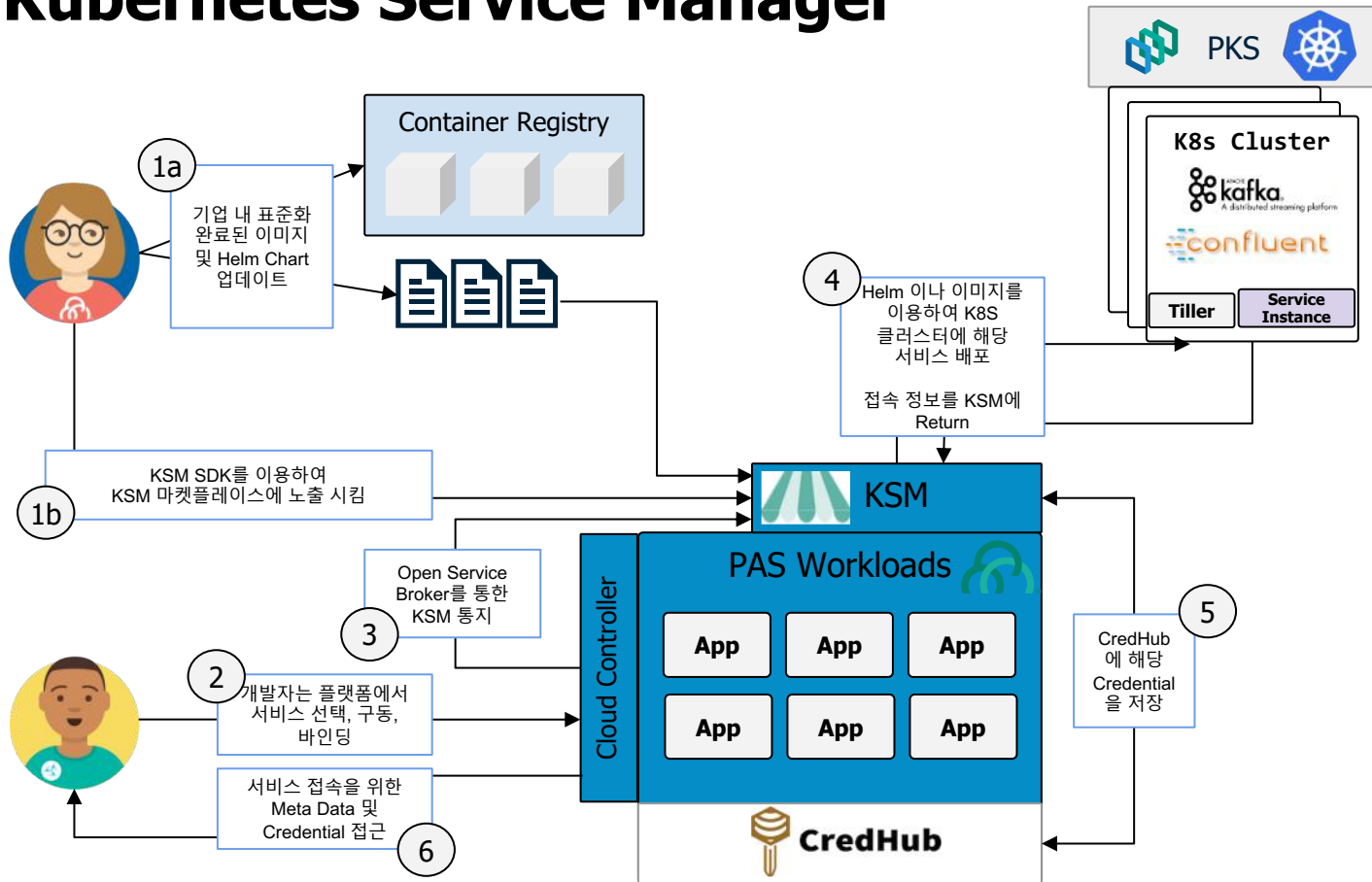
Managed services from AWS, Azure, GCP

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KSM - A broker to bridge PAS and PKS [beta]

1. **KSM (Kubernetes Service Manager)**는 플랫폼 엔지니어가 컨테이너 기반의 서비스를 자체 마켓플레이스를 통해 개발자에게 제공하는 형태

2. 오픈소스, 자체 개발, 상용 소프트웨어 모두 등록이 가능

3. 개발자는 동적으로 서비스 생성, 접속정보 바인딩, **ID/Password** 관리 등의 서비스를 제공받음
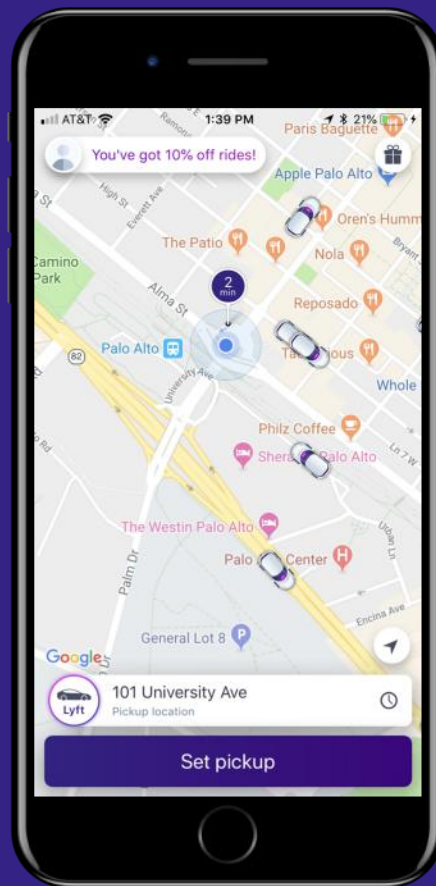
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KSM – Kubernetes Service Manager

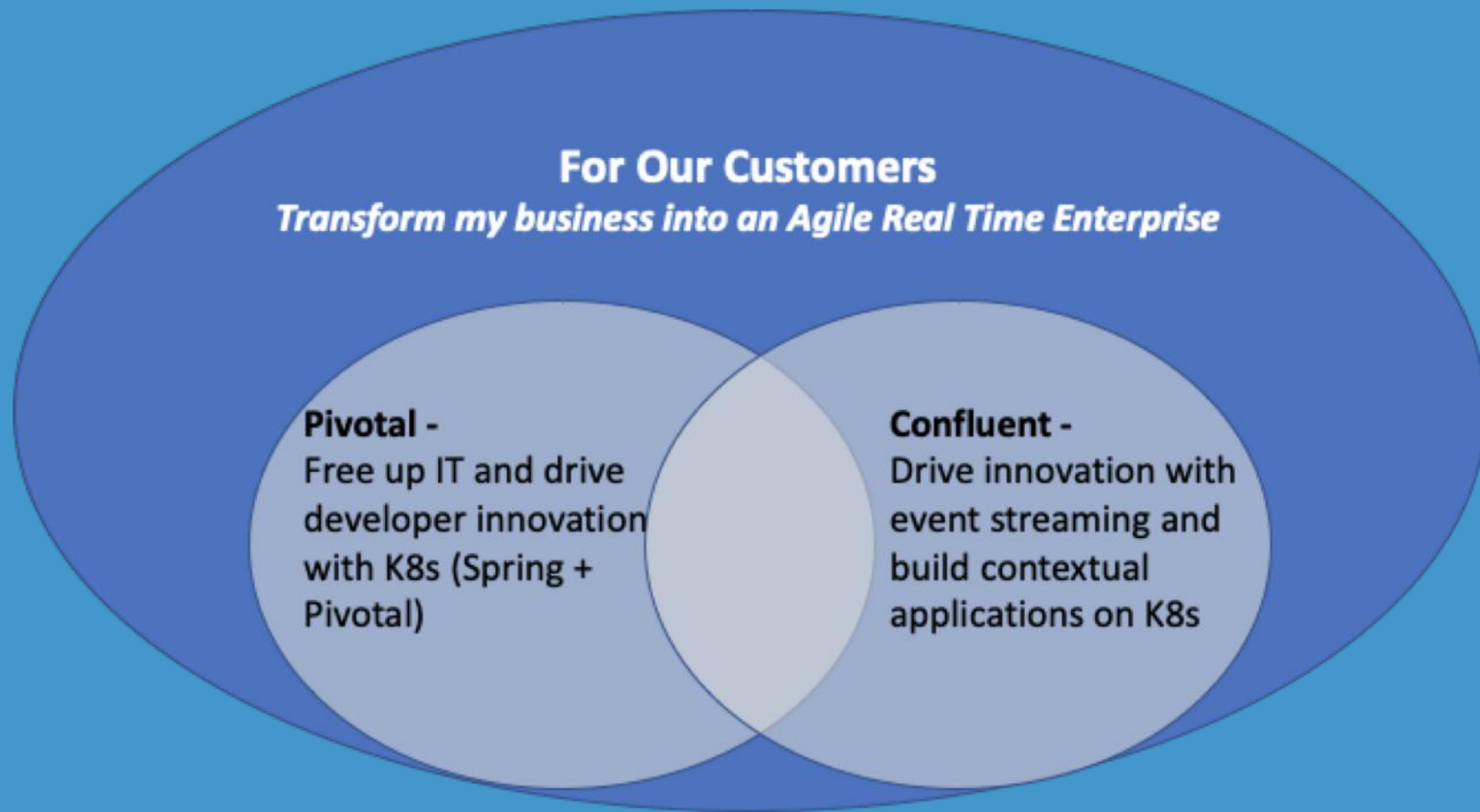# Customers expect rich digital experiences

🙋🏻‍♀️🙋🏽‍♂️ **When will my driver get here?**

- Only Event Streaming Platforms can answer a question like this
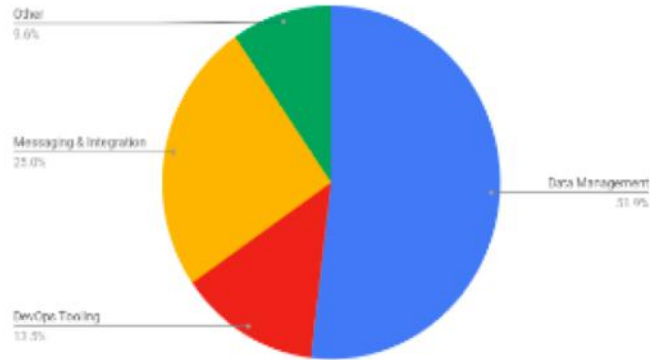
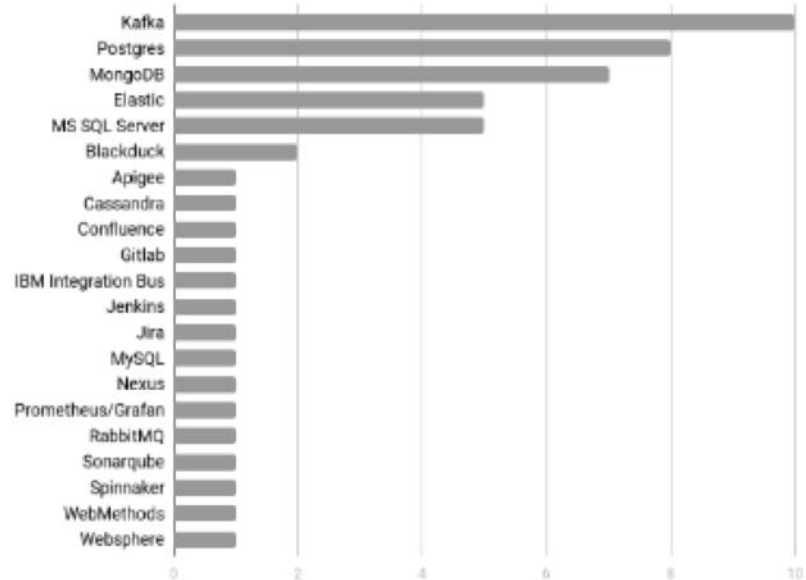- You need real-time data combined with stored data

Our Joint Vision

For Our Customers

Transform my business into an Agile Real Time Enterprise

Pivotal -
Free up IT and drive developer innovation with K8s (Spring + Pivotal)

Confluent -
Drive innovation with event streaming and build contextual applications on K8s

Confluent - The Most Requested Workload for PKS

ISVs on PKS by Category

Other 9.6%

Messaging & Integration 25.0%

DevOps Tooling 13.5%

Data Management 51.9%

Data Management   27
DevOps Tooling   7
Messaging & Integration   13
Identity & Security   2
Monitoring Metrics & Logging   1
Application Tier Networking & Gateway   1
Other   1

ISV Deployment Count

Kafka
Postgres
MongoDB
Elastic
MS SQL Server
Blackduck
Apigee
Cassandra
Confluence
Gitlab
IBM Integration Bus
Jenkins
Jira
MySQL
Nexus
Prometheus/Grafan
RabbitMQ
Sonarqube
Spinnaker
WebMethods
Websphere

Pivotal survey of their own customer base ~50% of the base responded

About Confluent

Jay Kreps
CEO and
Co-Founder

Neha Narkhede
CTO and
Co-Founder

Jun Rao
Co-Founder

Todd Barnett
Chief Revenue
Officer

Cheryl Dalrymple
Chief People
Officer

Giancarlo Lionetti
Chief Marketing
Officer

Founded by the original creators of **Apache Kafka®**

Founded
September 2014

Technology developed while **at LinkedIn**

69% of Active **Apache Kafka** Contributors

BENCHMARK

Data Collective

Index Ventures

LinkedIn®

SEQUOIA

Events are at Heart of Every Organization

An organization is defined through a series of events and its ability to respond to them

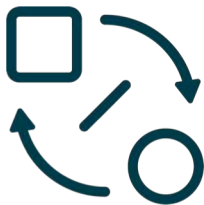A **digital organization** represents **events in data**

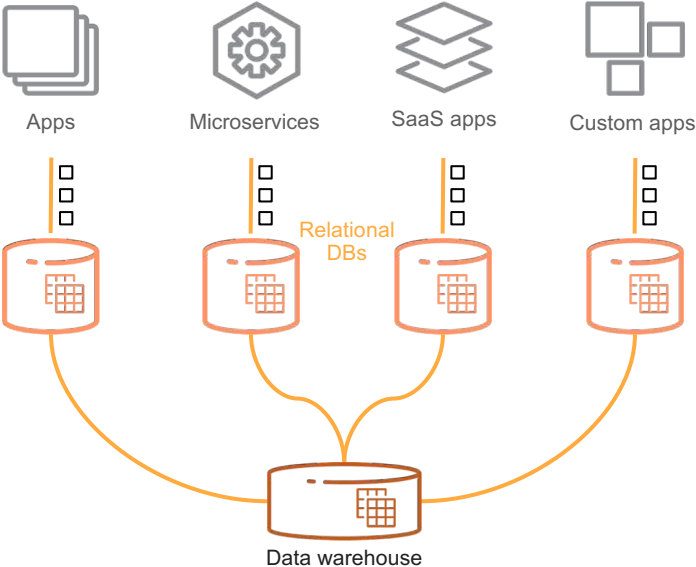A Client View

A Sale

ATrade

An Invoice

Build a Central Nervous System for your Modern Event-driven Enterprise

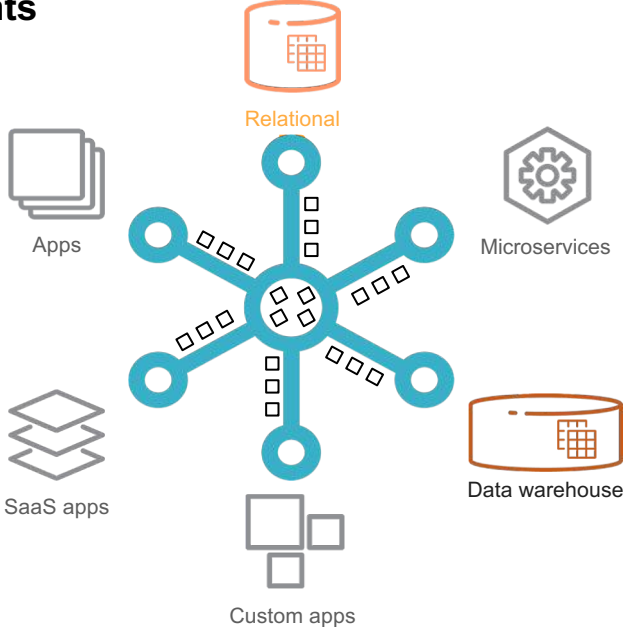Confluent enables companies to respond accurately and in **real time to business events**

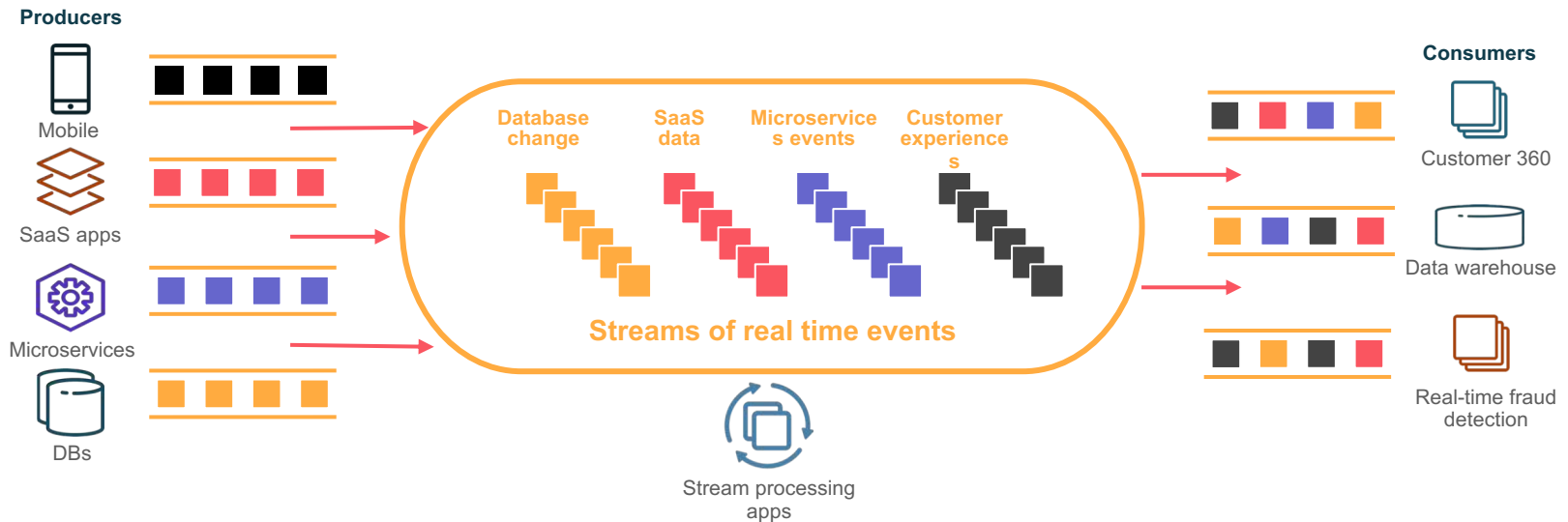# Implementing an Event-driven Architecture Requires a Paradigm Shift

From data represented in static tables...

...to data represented as streams of events

43

A Streaming Platform is the Underpinning of an Event-driven Architecture

Producers
- Mobile
- SaaS apps
- Microservices
- DBs

Streams of real time events
- Database change
- SaaS data
- Microservices events
- Customer experiences

Stream processing apps

Consumers
- Customer 360
- Data warehouse
- Real-time fraud detection

Ubiquitous connectivity
Globally scalable platform for all event producers and

Immediate data access
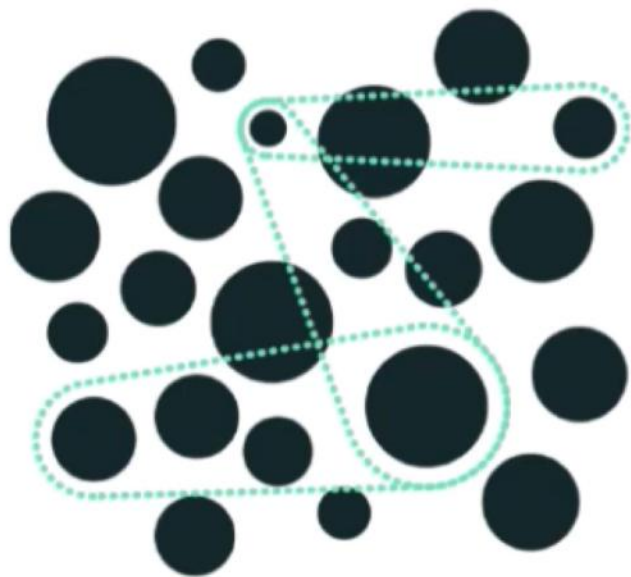Data accessible to all consumers in real time

Single system of record
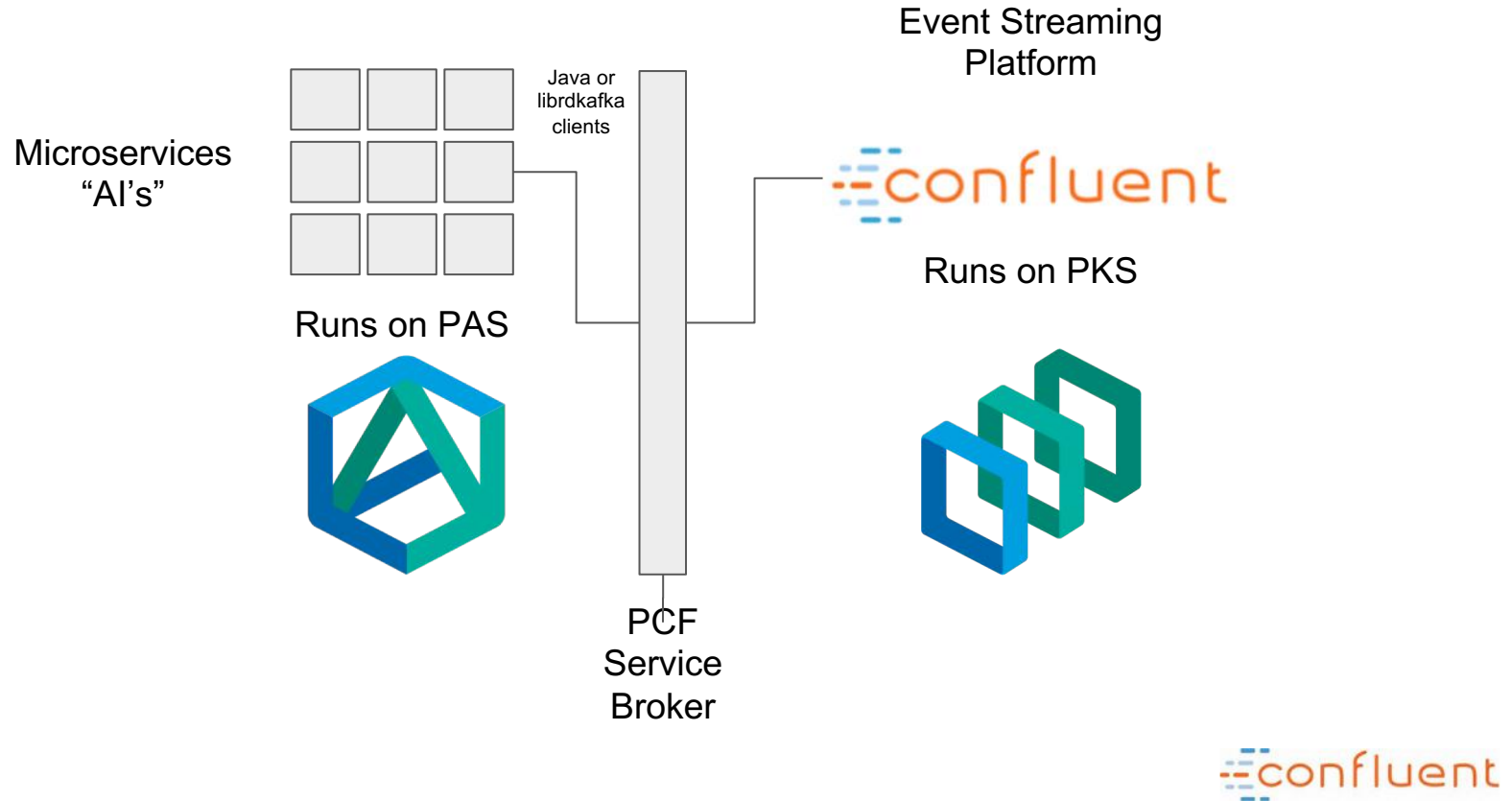Persistent storage to enable reprocessing of past events

Continuous queries
Stream processing capabilities for in-line data transformation

44

Why Microservices

- Scale Applications
- Scale Teams
- Independent Development Cycles
- Experimentation
- Resilience

High level architecture

Microservices "AI's"

Java or librdkafka clients

Event Streaming Platform

Runs on PAS

Runs on PKS

PCF Service Broker

confluent
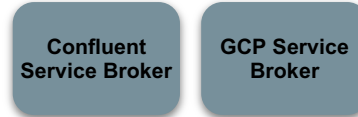
Thank You

Kubernetes First

Modularized Components

Eco-system

Managed services
(AWS, Azure, GCP)

K8S Helm
(ie. MongoDB)

BOSH tile
(i.e. RabbitMQ)

Services
Marketplace