The Evolution of a Platform

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Agenda

• What is Platform?
• 3 Key Points
  • Kubernetes First
  • Modularized Components
  • Standardized Marketplace
• Confluent Platform
What is Platform?
현업 | 개발
--- | ---
업무협의, 요건정의 | 개발자용 API, 콘솔
포털 UI 혹은 API 호출 | 애플리케이션 동작
On-demand VM, Network, Storage | 개발자의 반응, API 호출
Feedback | Features
IaaS | PaaS
/generated/ | Libs
OS | 애플리케이션
I/O | 네트워크
네트워크 | 스토리지
스토리지 | 메모리
네트워크 | I/O
소프트웨어 | 메모리
API | 개발자의 반응
추상화 정도 | 개발자의 반응

Pivotal.
발주, 요구, 조건 정의, 작업 협의, 계약, 발주, 도입, 설치, 변경

포털 UI 혹은 API 호출

On-demand VM, Network, Storage

개발자용 API, 콘솔

애플리케이션 동작

Feedback

Features

PaaS

API

IaaS

Platform Team

I/O

권한

권한

Libs

미들웨어

모니터링

로그

OS

네트워크

스토리지

컴퓨팅

메모리

로깅

모니터링

워크

I/O

Platform Team

추상화 정도
Three Key Points
1 Kubernetes First

2 Modularized Components

3 Standardized Marketplace

Managed services (AWS, Azure, GCP)

K8S Helm (i.e. MongoDB)

BOSH tile (i.e. RabbitMQ)
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

Ops Manager VM  BOSH Director VM

vSphere + NSX-T

K8s cluster: pas-k8s
namespace: pas-eirini

PAS for K8s Control Plane

Loggregator

Router

Cloud Controller

Eirini/0
Modularized Components

- Securely assemble, deploy, and update code
  - Pivotal Build Service

- Use supported Java, Spring and Tomcat
  - Pivotal Spring Runtime

- Execute functions in response to events
  - Pivotal Function Service

- Get observability and routing as a managed service
  - Pivotal Ingress Router

- Monitoring, Logging, User/Role Manage
  - Pivotal App Service

kubernetes

Pivotal Application Service

Pivotal Container Service

- Harbor
- Cloud Foundry
- BOSH
- NSX-T

- VMware
- Azure
- Google Cloud Platform
- AWS
- OpenStack

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More Flexibility

- Pivotal Build Service
- Pivotal Spring Runtime
- Pivotal Function Service
- Pivotal Ingress Router
- Pivotal Services Marketplace

More Efficiency

Option 1.

Option 2.

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Modularized Components

Pivotal Build Service (PBS)
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

cfninuxfs3 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

cfninuxfs3 releases

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

example.com/myapp/mytag

CI/CD Tools

Build Service

consumes

builds

Latest Build
- Build # 3
- Build # 2
- Build # 1

deploys

Build Service: How It Works
500 Different Apps
How to apply patches?
Modularized Components

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

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

Pivotal Ingress Router (Istio)
Envoy is the Proxy, Istio is the Control Plane

- **Istio**
  - Pilot
  - Mixer
  - Citadel

**Control Plane API**

- Configure Envys
- Policy checks, telemetry
- TLS certs to Envys

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**External Client**

**Infra Load Balancer**

**Ingress Envoy**

**Sidecar Envoy**

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**Service A**

**Service B**

**Service C**

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

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- Load Balancing
- Circuit Breaking – Re-tries
- Traffic Management
- Security (TLS)
- Metrics
클러스터 생성 시마다 DNS 설정 및 Load balancer 설정을 할 필요 없음
Envoy를 이용하여 Ingress를 구현
멀티 클러스터를 열어서 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 Roadmap (cont.)

- Service to Service (Container to Container)
- Client-side load balancing, Timeouts, and Retries
- 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: svc-1.my-namespace.svc.cluster.local
          host: svc-1
        - destination: svc-2.my-namespace.svc.cluster.local
          host: svc-2
```

Container

TCP Router

Gorouter

Sidecar

App v2

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Standardized Marketplace
A multi-platform services marketplace

- BOSH managed tile (i.e. RabbitMQ)
- Kubernetes Service Manager
- Helm packaged software (i.e. MongoDB)
- Managed services from AWS, Azure, GCP
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
KSM – Kubernetes Service Manager

1a.企業内標準化完成のイメージ及びHelm Chart更新

1b. KSM SDKを利用しKSMマーケットプレイスに出荷

2. 開発者はプラットフォーム上でサービス選択、作成、バインディング

3. Open Service Brokerを通じてKSM通報

4. Helmまたはイメージを用いてK8Sクラスターに該当サービスを展開

5. 接続情報をKSMに返す

6. サービス接続に必要なMeta Data及びCredentialのアクセス

Container Registry

PAS Workloads

Cloud Controller

KSM

App

App

App

App

App

App

CredHub

K8s Cluster

Kafka

Confluent

Gigaport

Tiller

Service Instance
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

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

Ubiquitous connectivity
Globally scalable platform for all event producers and consumers

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
Why Microservices

- Scale Applications
- Scale Teams
- Independent Development Cycles
- Experimentation
- Resilience
High level architecture

Microservices “AI’s”

Runs on PAS

Java or librdkafka clients

PCF Service Broker

Event Streaming Platform

Runs on PKS
Service Discovery Across Data Centers

Confluent Cloud Enterprise
- Confluent Dedicated
- Confluent Shared

GCP Native Services

Confluent Cloud

Confluent Self Managed

Pivotal Container Service

Confluent Service Broker

GCP Service Broker

Pivotal Application Service

Customer Cloud

On Premise DC

Confluent Self Managed

Confluent K8S Operator

Pivotal Container Service

Pivotal Application Service

GCP Service Broker

K8S Operator
Thank You
Kubernetes First

Modularized Components

Eco-system

Managed services (AWS, Azure, GCP)

K8S Helm (i.e. MongoDB)

BOSH tile (i.e. RabbitMQ)