Pivotal Cloud Foundry Overview

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Agenda

- Platform Evolution
- Pivotal Cloud Foundry Overview
Customer Outcome by Pivotal Platform

@scotiabank scaled to 29 teams in 4 countries 3000+ deploys/month in 10 month with @pivotalcf transforming a 185 year old bank #SpringOne

I’ll say it again - yes *your* company in *your* industry can adapt and change. You too can go from releases in 14 months to 14 days like @markardito at @HCSC #springone

6x increase in asset utilization at @Boeing. Oh and MVPs in 3-5 months, down from 1-3 years. #SpringOne
Customer Outcome by Pivotal Platform

### Our Results

#### Resiliency (run the business)
- 81% Impact Minutes
- 53% Failure Group Size
- 47% MTTR
- 44% Incident Frequency
- 35% API Response Times
- 60% App / Infr. Root Cause

#### Time to Market (change the business)
- 90% Time to Scale
- 50% Time to Market

#### Scale
- 283% Transaction Growth
- 490% PaaS Growth 2015

- 1,500+ Developers
- 5,000+ Applications
- 4-6 Operators
- 210M Daily Transactions
- 2X Faster Time to Market
- 80% Better Resiliency
- 10X Faster to Scale
- 25% 'Oxygen' increase

Source: Greg Otto, Executive Director, Cloud Services at Comcast, CF Summit June 2017
Most difficult challenge for Enterprise without Platform
Platform is FOUNDATION for Faster, Strong Outcome
Typical Customer Outcomes with Pivotal Cloud Foundry

**Speed**
Deploy new code thousands of times a month

**HIGHLIGHTS**
- Best platform for Spring Boot
- Container-ready
- Native Windows + .NET
- Full integrated with CI/CD

**Stability + Scalability**
Deliver enterprise SLAs and breakthrough operational efficiency

**HIGHLIGHTS**
- Four layers of HA
- Zero downtime deployments
- Logging, metrics, and scaling
- Linux + Windows Server

**Security**
Improve your security posture with built-in capabilities

**HIGHLIGHTS**
- “Secure by default” containers
- Full-stack support
- Rapid fixes to CVEs
- “Repair, repave, rotate”
Platform Evolution
There are many ways to package and run workloads in the cloud

- Containers
- Batches
- Event-driven Functions
- Microservices
- Data Services
- Monolithic Applications
Your goal: choose the right runtime for each workload
Choose the right tool for the job

**CONTAINER**
- Container Scheduling
- Primitives for Network, Routing, Logs & Metrics

**APPLICATION**
- Container Orchestrator
- Container Image & build
- L7 Network & Routing
- Logs, Metrics, Monitoring
- Services Marketplace
- Team, Quotas & Usage

**FUNCTION**
- Container Orchestrator
- Function execution
- Function scaling
- Event stream bindings

**Developer**
Provides

**Tool**
Provides

**IaaS**
Use the highest abstraction possible

Your strategic goal: Push as many workloads as technically feasible to the top of the platform hierarchy
Pivotal Cloud Foundry Overview
Pivotal Container Service

**Built with open-source Kubernetes**
Constant compatibility with the latest stable release Kubernetes — no proprietary extensions.

**PKS Control Plane**
Use the PKS CLI and API to create, operate, and scale your clusters.

**Kubernetes**
Enterprise-Grade Kubernetes

**Harbor**
An enterprise-class container registry. Includes vulnerability scanning, identity management, and more.

**NSX-T**
Network management, security, and load balancing out-of-the-box with VMware NSX-T. Multi-cloud, multi-hypervisor.

**BOSH**
Reliable and consistent operational experience for any cloud.

Deploy on:
- VMware
- GCP
- Azure
- AWS
Pivotal Application Service (PAS): A Runtime for Apps

Best runtime for Spring and Spring Boot — Spring’s microservice patterns—and Spring Boot’s executable jars—are ready-made for PAS.

Turnkey microservices operations and security — Spring Cloud Services brings microservices best practices to PAS. It includes Config Server, Service Registry, and Circuit Breaker Dashboard.


Built for apps — PAS has everything to need to run apps. Buildpacks manage runtime dependencies; metrics, logging, and scaling are done for you. Multitenancy, and blue/green deployment patterns are built-in. Extend apps with a rich service catalog.

Container-ready — PAS supports the OCI format for Docker images. Run platform-built and developer-built containers.
Pivotal Function Service (PFS): A Runtime for Functions

Execute functions in response to events. Use PFS to handle web events, event-based integration, and large scale streaming data.

- **Trigger functions via HTTP/Message Broker** — With PFS, you can quickly set up functions for a variety of events. PFS is architected to support pub/sub message delivery over messaging channels.

- **Run functions anywhere** — PFS lets you easily run functions on-premises and in the public cloud for maximum flexibility.

- **Built on Knative** — PFS is built on Knative, an open-source project led by Google. Knative simplifies how developers deploy functions atop Kubernetes and Istio.

- **Pluggable build system** — PFS features a source-to-container mechanism to simplify deployment. Use proven components like Cloud Foundry Buildpacks.

- **Pluggable event sources** — PFS Event Sources facilitate the creation of Feeds from a variety of external event sources such as GitHub webhooks, blob stores, and database services.

- **Pluggable event brokers** — PFS can be connected easily with popular message brokers such as Kafka, Google Pub/Sub, and RabbitMQ.
Embrace an Autonomous Platform

Snowflake Automation
- Ad hoc, Fragile Automation
- Procedural Scripted Runbooks
- Complex/Custom Configurations
- Failure Sensitive Infrastructure
- Version control & repository
- Difficult to Port/Replicate
- Script Maintenance Overhead

Manual, Slow, Inflexible, Error-Prone

Autonomous Platform
- Consistent Declarative Contracts
- Adaptable, repeatable platform
- Managed DevOps processes
- Developer + Ops Friendly Constructs
- Easy to move/re-architect apps
- Infrastructure Failure Agnostic

Intelligent, Fast, Flexible, Safe
Pivotal Platform Automation Simplifies Updates & Upgrades

Building blocks for teams to create a repeatable and reusable automated pipeline for upgrading and installing Pivotal Platform foundations.

- Works with Concourse and leverages Concourse tasks
- Contains and extends om commands (the Ops Manager API)
- Provides an example pipeline to show how to string together tasks
- Provides a way to extract configuration files, so tasks can support multi-foundation environments.
- IaaS agnostic. Tasks are consistent across IaaS targets.
- Reusable tasks. Run tasks over and over, instead of having to make manual changes.
No More Tickets — Self-Service Provision and Deploy

Speed & Consistency

Code Complete & Tested

- Find available hosts
- Install & configure runtime
- Install & configure middleware
- Pull application source code
- Retrieve dependent libraries
- Create application package
- Install, configure dependent service(s)
- Deploy container to host(s)
- Load environment variables
- Configure load balancer
- Configure firewalls
- Update service monitoring tools
- Configure log collector

- 2 Days
- 1 Day
- 1 Day
- ¼ Day
- ¼ Day
- ½ Day
- ¼ Day
- 2 Days
- ½ Day
- 2 Days
- 3 Days
- 1 Day
- ...  

Application in Production

- ~45 seconds
- ~15+ Days

cf push
Platform Automation for Enhanced Security

**Turnkey Compliance**
Apps inherent controls from the platform, simplifying audits.

**Repair**
Repair vulnerable software as soon as updates are available.

**Repave**
Repave servers and applications from a known good state. Do this often.

**Rotate**
Rotate user credentials frequently, so they are only useful for short periods of time.

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Reduce Your MTTR | Resist Advanced Persistent Threats | Reduce the Threat of Leaked Credentials
CredHub Mitigates the Risk of Leaked Credentials

CredHub delivers centralized management of platform and application creds.

- Credentials are the bedrock for trust in the cloud.
- CredHub’s goal: deliver cradle-to-grave management of credentials (create, access control, distribution, rotation, logging)
- Manages passwords, certificates, ssh keys, RSA keys, and arbitrary values (strings and JSON blobs).
- All credentials are encrypted w/a key that rotates (HSM support in OSS & Pivotal Platform)
- CredHub Service Broker for off-platform services
Extend Apps with Brokered Services from Pivotal

MySQL for PCF
- Enterprise-ready MySQL for your developers
- Automate database operations in developer workflows
- Leader-follower for DR
- NEW: HA via Galera clustering, Multi-DC replication

Pivotal Cloud Cache
- High performance, in-memory, data at scale for microservices
- Look-aside caches & HTTP session state caching
- WAN replication
- NEW: OAuth2 integration

RabbitMQ for PCF
- Easily connect distributed applications with the most widely deployed open source message broker
- Enable connected scalable, distributed applications
- NEW: PCF Healthwatch integration

Redis for PCF
- In-Memory cache and datastore, configured for the enterprise
- Efficient provisioning matched to use cases
- NEW: Random service instance placement across AZs.

BOSH Managed | On-Demand Provisioning | Dedicated Instances | Custom Service Plans
ISV Ecosystem Momentum Drives Platform Advantage
Open Service Broker API: Easily Add Services to Apps and Containers

1. Create a service broker
2. Add it to your CF marketplace, or KBs service catalog
3. Create a service instance; choose your plan size
4. Bind the service to your app or KBs pod
5. Unbind the service
6. Delete the service when it’s no longer needed

Flexible Deployment Models

Extend Apps with Popular Services

Supports the Permissions of Cloud Foundry and Kubernetes

OSBAPI Supports Unique Credentials for Every App

Simple Configuration

Open Source
In Summary
Pivotal’s partnership approach to software is holistic

- **Culture**
  Continually improve and deliver customer success

- **Methodology**
  Learn the necessary practices to build modern software

- **Tools**
  Build with products focused on developer productivity

- **Platform**
  Run every app, on every cloud, on a unified platform

**Cloud-native software**