Pivotal Cloud Foundry 2.0: A First Look

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Agenda

- Trends & Pivotal Value Proposition

- PAS

- PKS

- PFS: Coming Soon

- Q+A

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Industry Direction

What's shaping **your** future

Decentralized I.T. Workloads in more clouds, localized app ownership, attention on self-service, and a shared focus on business value.

Accelerating transformation. Companies moving faster towards software-driven future. This means new skills, and more diverse runtimes needed.

Security as a CEO priority. Threats, new and old, have major business impact. Passive security isn't enough.

Reactive architecture takes hold. Applications become event-driven in order to drive real-time insight and behavior.

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The Pivotal value proposition

Developer Productivity

- Accelerate feedback loops by improving delivery velocity

- Focus on applications, not infrastructure

- Give developers the tools and frameworks to build resilient apps

Operational Efficiency

- Employ 500:1 developer to operator ratio

- Perform zero-downtime upgrades

- Runs the same way on every public/private cloud

Comprehensive Security

- Adopt a defense-in-depth approach

- Continuously update platforms to limit threat impact

- Apply the 3 R's ➜ repair, repave, rotate

High Availability

- Run platforms that stays online under all circumstances

- Scale up and down, in and out, through automation

- Deploy multi-cloud resilience patterns

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Customer Outcomes

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

After 10 Months, with Our PAAS PCF Platform
29 teams 4 countries 3000+ deploys/month
Scotiabank

10:28 AM - 5 Dec 2017

Nate Schutta
@ntschutta
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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

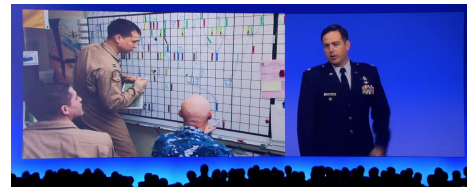MONTHS TO WEEKS TO DAYS
Development Time
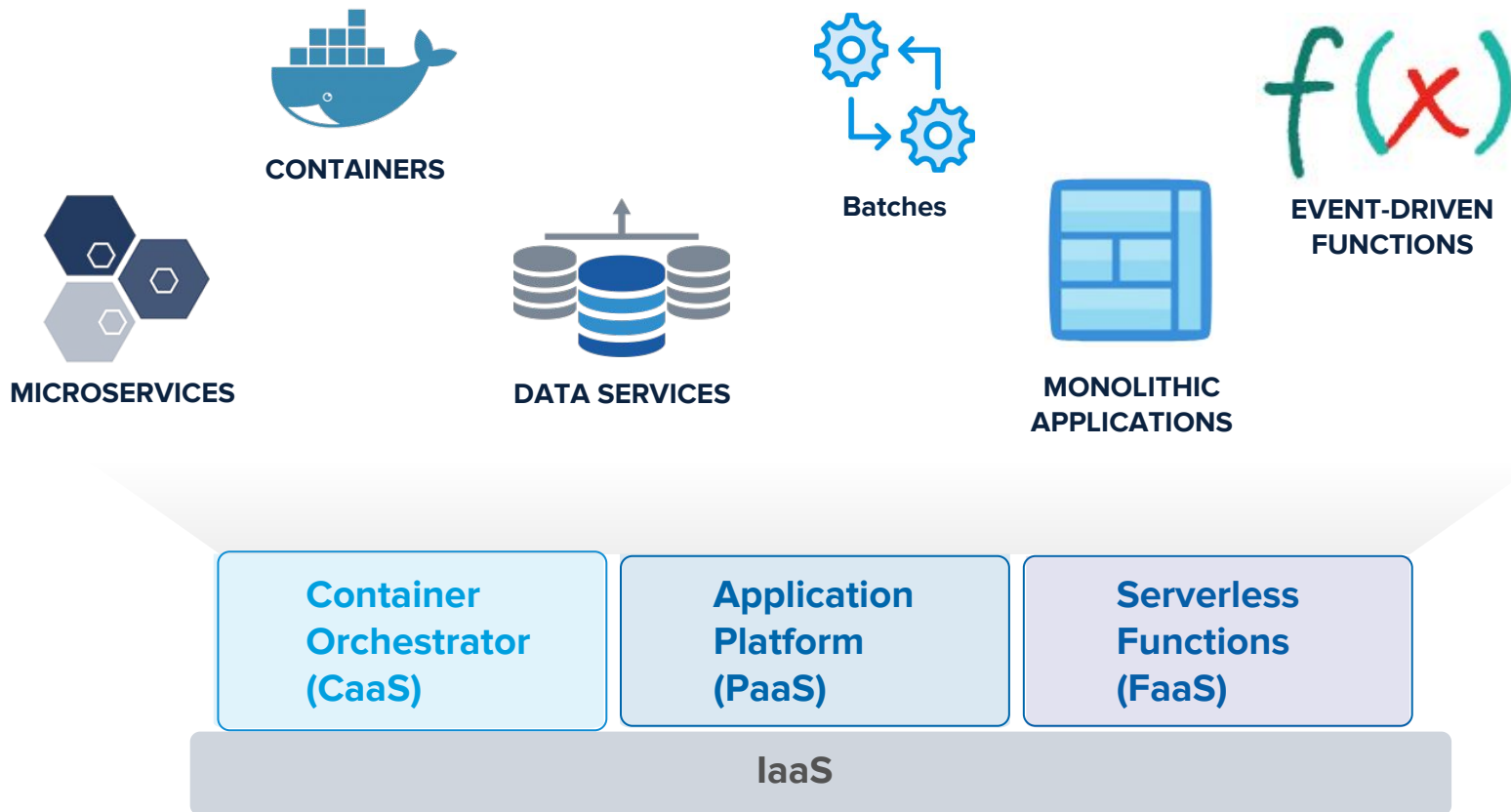
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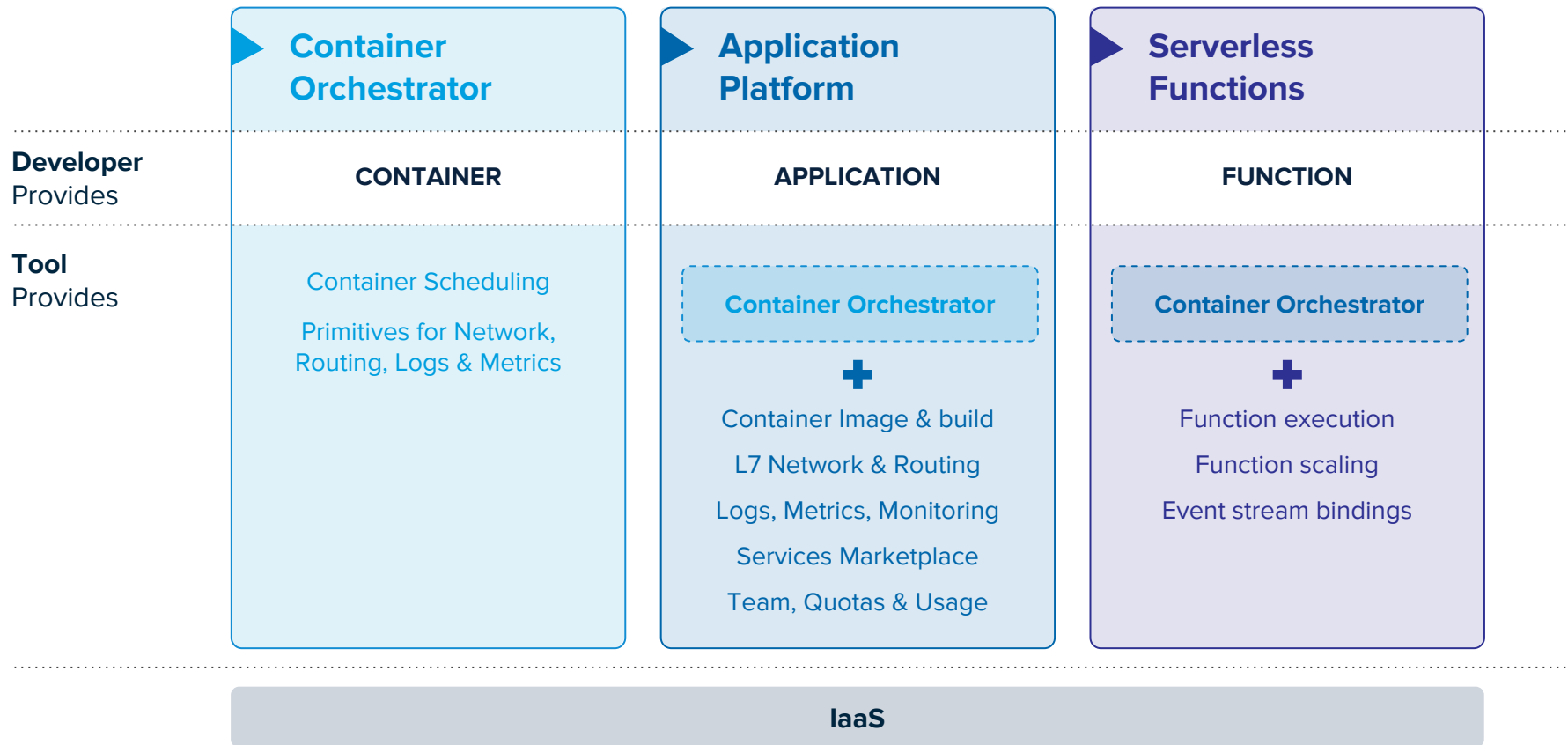

Zach Brown
@moredeploys

This is how you _do_ software: "The tanker refuelling system software for the air force – which runs on Pivotal #CloudFoundry – was built [by @pivotallabs] for <$2 million in 90 days and is currently saving the US Air Force $1 million/day in fuel costs..."

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Using the right abstraction is key for results
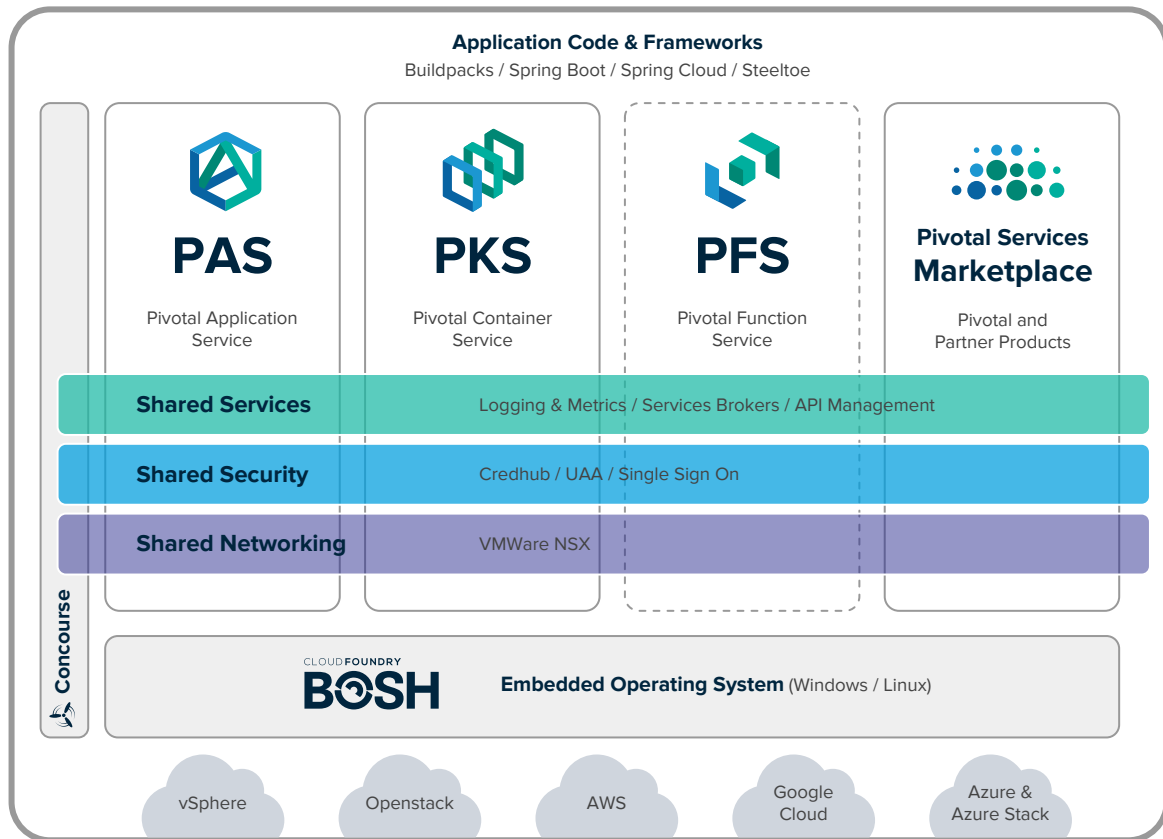
CONTAINERS

Batches

EVENT-DRIVEN
FUNCTIONS

MICROSERVICES

DATA SERVICES

MONOLITHIC
APPLICATIONS

Container Orchestrator (CaaS)	Application Platform (PaaS)	Serverless Functions (FaaS)

IaaS

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Apps, Containers, Functions, oh my

	Container Orchestrator	**Application Platform**	**Serverless Functions**
Developer Provides	CONTAINER	APPLICATION	FUNCTION
Tool Provides	Container Scheduling Primitives for Network, Routing, Logs & Metrics	**Container Orchestrator** **+** Container Image & build L7 Network & Routing Logs, Metrics, Monitoring Services Marketplace Team, Quotas & Usage	**Container Orchestrator** **+** Function execution Function scaling Event stream bindings

IaaS

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Higher flexibility and
less enforcement of
standards

**Serverless
Functions**

Application Platform

Container Orchestrator

IaaS

Hardware

Lower development
complexity and higher
operational efficiency

Strategic goal: Push as many workloads as technically
feasible to the top of the platform hierarchy

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Pivotal Application Service (PAS): A Runtime for Apps

Increase speed and deploy code to production thousands of times per month. Use PAS to run Java, .NET, and Node apps.

Pivotal
Application Service™

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.

A native Windows and .NET experience — Use PAS to run new apps built with .NET Core. Run your legacy .NET Framework apps on PAS too, using the .NET Hosted Web Core buildpack. Push applications to containers running on Windows Server 2016.

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.

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PAS – Top Themes

Best Platform for Spring	First-class Windows & .NET Support	Developer Productivity
Streaming and Batch Processing	Operator Productivity	Secure by Default
Enterprise-ready Services	Choice of IaaS	PCF Ecosystem Growth

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Secure by Default

What's new

- Gorouter & HAProxy support multiple TLS certs and SNI

- Custom Certificate Authorities for HAProxy and Gorouter

- HAProxy supports mutual authentication between clients and applications using `X-Forwarded-Client-Cert` header

- All traffic between HAProxy and Gorouter is TLS

- PAS Credhub: Securely Stores Service Instance Credentials

- RBAC for Ops Manager, 4 new roles beyond just "admin"

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Operator Productivity

What's New

Deeper VMware NSX integration. Cloud Foundry Operations Manager integrates with NSX Manager. NSX-T is integrated into Cloud Foundry through CNI. Containers get an IP on an NSX-T network.

Pivotal Container Service (PKS). Build and operate highly-available Kubernetes environments. Integrated with VMware NSX, Harbor, and Google Cloud Platform.

PCF Healthwatch. Opinionated PCF monitoring dashboard that covers recommended KPIs and scaling indicators.

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PCF Healthwatch: KPIs & Super Metrics
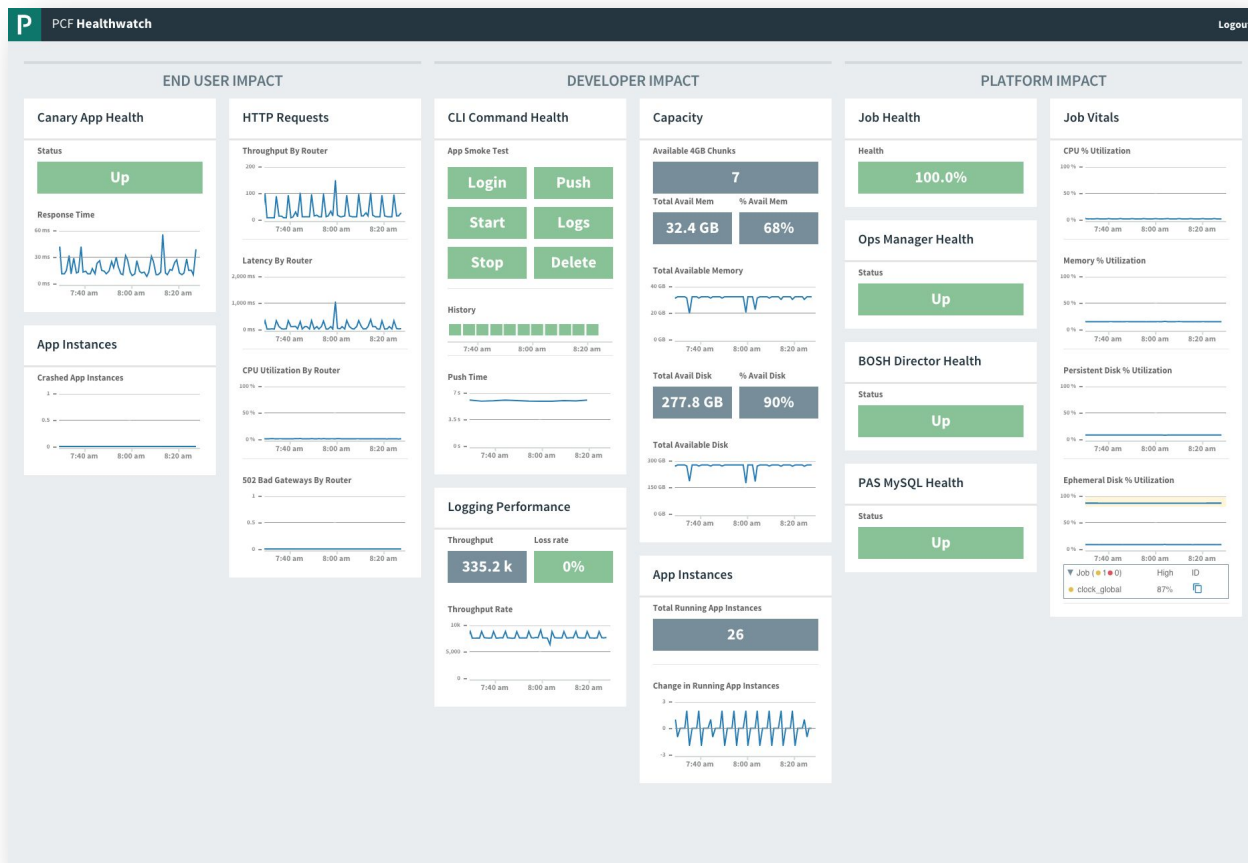
Developer Productivity

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What's New

Apps Manager Improvements. One-click service creation, more Spring Boot actuator integration, Scheduler integration, and multi-buildpack support.

Concourse for PCF. Multi-pipeline dashboard, and improved stability.

New IDE tool support. New release of Spring Tool Suite, plugins for Visual Studio Code and Atom. Plugins help developers build Spring Boot applications and configure Cloud Foundry manifests.

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Best Platform for Spring

What's New

PCF 2.0 Apps Manager integration. Shows service endpoints exposed by your Spring Boot app. Builds on previous integrations for developers.

IBM Liberty support. Spring developers can embed IBM Open Liberty as the embedded app server. IBM now supports Websphere Liberty buildpack on PCF.

Spring Cloud Services 1.5. Use Pivotal-managed or BYO data services underneath. Service credentials stored in CredHub.

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Streaming and Batch Processing

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What's New

Spring Cloud Data Flow for PCF. Due in January, this auto-provisions all the components (Data Flow server, Redis, RabbitMQ, MySQL) into a managed, cloud-native integration service on PCF.

PCF Scheduler. Extends existing support for one-off tasks with a component that initiates batch jobs on a schedule.

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PAS for Windows

What's New

Windows Server containers. Stemcell for native Windows container support and Windows 2012/2016 Tiles. Brings CPU and network limits, CPU autoscaling, encrypted Credhub creds, CF SSH for Windows and more.

Steeltoe joined the .NET Foundation. Pivotal donated this .NET microservices framework to the Foundation, and will continue to improve it. **Version 2.0 (supporting ASP.NET Core 2.0) due in January!**

.NET health endpoints (actuators) visible in PCF Apps Manager. View health/trace/mapping info for .NET apps, all in one place.

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Choice of IaaS

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What's New

**Small Footprint PCF in Azure Marketplace.** Significantly smaller edition of PCF now live in the Azure Marketplace.

Beta support for Microsoft Azure Stack. Deploy PCF 2.0 to Azure Stack environments. Uses the same Cloud Provider Interface (CPI) as public cloud Azure.

Google Cloud Platform usage credits. Customers of PCF 2.0 get an entitlement to use GCP credits.

Pivotal Ready System from Dell EMC. Coming in January. A complete appliance with Pivotal Cloud Foundry 2.0 with VMware vSphere and NSX.

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Pivotal Services Marketplace
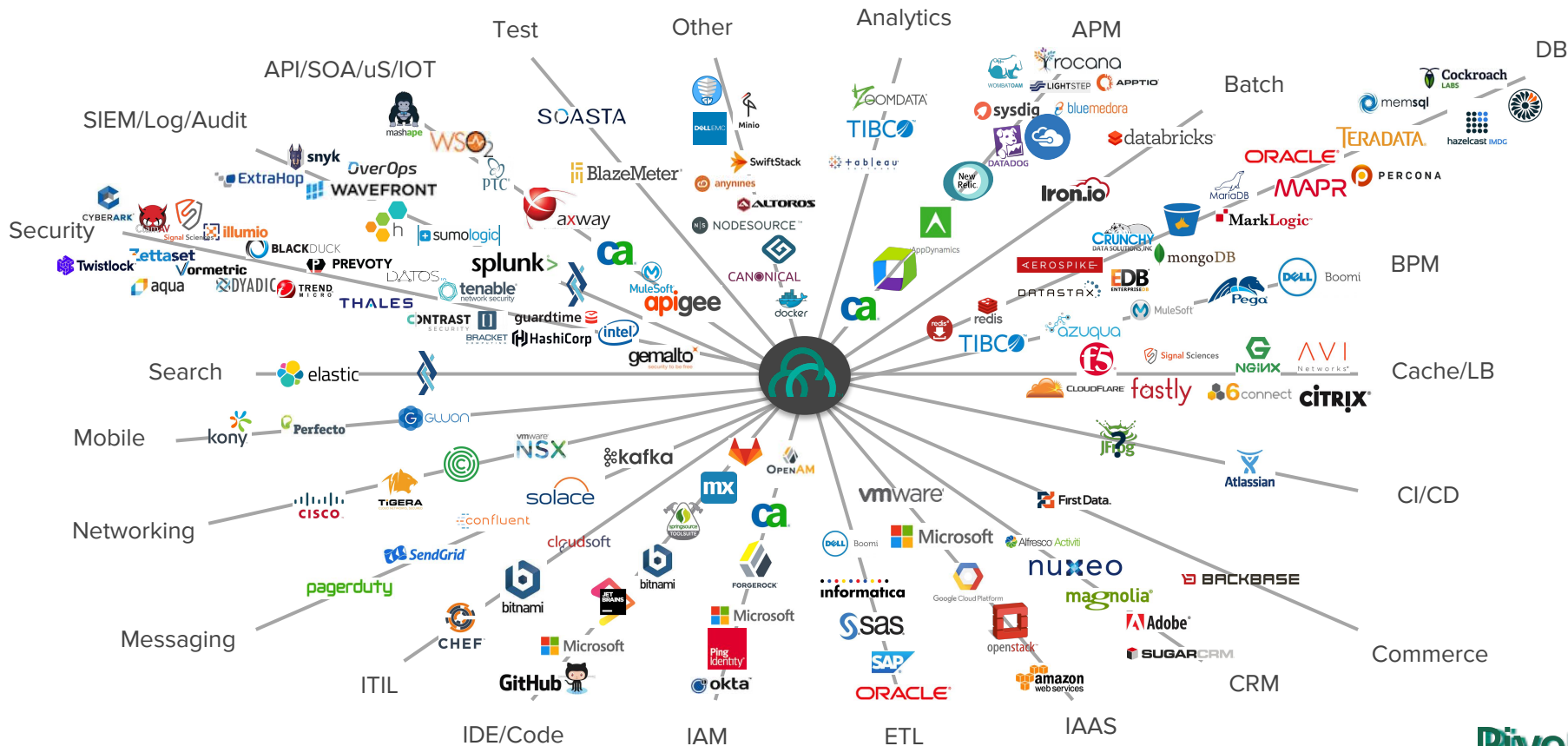
Enterprise Ready Services

MySQL for PCF

- Enterprise-ready MySQL for your developers

- Automate database operations in developer workflows

- **NEW:** Leader-follower for multi-site HA

Pivotal Cloud Cache

- High performance, in-memory, data at scale for microservices

- Look-aside caches & HTTP session state caching

- **NEW:** WAN replication

RabbitMQ for PCF

- Easily connect distributed applications with the most widely deployed open source message broker

- Enable connected scalable, distributed applications
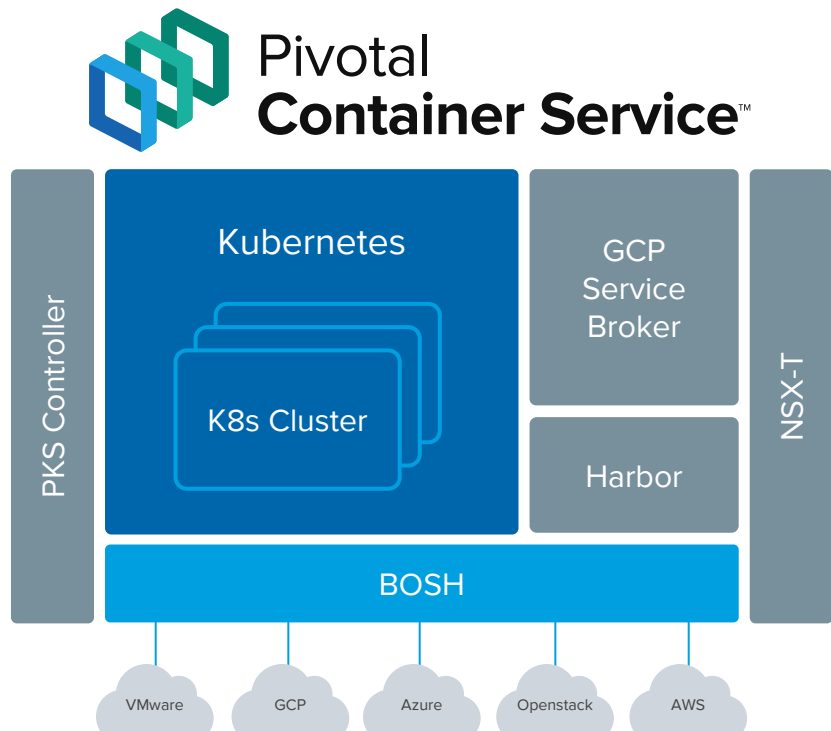
- **NEW:** On-demand clusters

Redis for PCF

- In-Memory cache and datastore, configured for the enterprise

- Efficient provisioning matched to use cases

BOSH Managed | On-Demand Provisioning | Dedicated Instances | Custom Service Plans

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Pivotal Container Service (PKS): A Runtime for Containers

Built with open-source Kubernetes — Constant compatibility with the current stable release of Kubernetes, operated by BOSH. No proprietary extensions.

Production-ready — Highly available from apps to infrastructure, no single points of failure. Built-in health checks, scaling, auto-healing and rolling upgrades.

Multicloud — BOSH provides a reliable and consistent operational experience. For any cloud.

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

GCP APIs access — The GCP Service Broker allows apps to transparently access Google Cloud APIs, from anywhere. Easily move workloads to/from Google Container Engine (GKE).

Fully automated Ops — Fully automated deploy, scale, patch, upgrade. No downtime. Use CD pipelines to deploy your platform, too.

Pivotal Container Service (PKS)

A turnkey solution to provision, operate and manage enterprise grade Kubernetes clusters

Pivotal.

+

vmware®

+

Google

Kubernetes Dial Tone:
- Health management
- Aggregated Metrics and Logging
- Autoscaling
- Persistence interface

Control Plane:
- Provisioning Engine
- T-shirt sized Clusters
- Self-service Clusters
- Software Update Automation
- Load balancing
- Networking
- Multi-tenancy

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.

Pivotal Function Service™

Trigger functions via HTTP/Message Broker — PFS is architected to support event stream processing, connecting to message topics via a language-neutral, function container interface.

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

Use modern DevOps workflows — PFS allows you to use familiar, container-based workflows for serverless scenarios.

Pluggable event brokers — PFS can be connected easily with popular message brokers such as Kafka, RabbitMQ, Google Pub/Sub, and AWS Kinesis.

Polyglot — PFS supports the authoring of functions in your chosen framework - Node.js, Spring/Java, or Shell.

Kubernetes Native — PFS runs natively on top of Kubernetes, making it easy to trigger code or containers in response to events.

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PFS Use Cases

Web Events

- Website back-end services like form post handlers, authentication, tracking and logging.

- APIs to back-end data services for mobile and web apps e.g GraphQL

- Webhook handlers

- Chat integrations

- Digital assistant services e.g. Alexa skills

Event-based Integration

- Scheduled tasks, ETL

- File processing
  e.g. images and videos

- Security scanning

- Complex Event Processing and Change Data Capture

- Monitoring, notifications and alerting

- Custom auth
  e.g. via API Gateway

Stream Processing

- IoT streams

- Log ingestion

- Event streams e.g. with Kinesis

- ML pipelines

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- Software published to network.pivotal.io
- Many features available now run.pivotal.io
- Contact your account team for PKS/PFS availability
- Sign up for the next roadmap call
  roadmap-registration.cfapps.io
  (First Thursday of every month, 2pm ET/11am PT)
- SpringOne Platform videos now online
  https://springoneplatform.io/sessions

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