INTRODUCTION AUX APPLICATIONS CLOUD NATIVE AVEC PIVOTAL READY SYSTEM

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Every Business is Becoming a Digital Business
Business are Looking to Move Much Faster

Agile Development With Continuous Delivery Accelerates improvement

Data Analytics Deliver New Insights

New Applications & Smart Devices Transform The Business
Software The Old Way

Monolithic

- Easy to deploy
- Modularity dependent on language/frameworks
- Change cycles tightly coupled
- Inefficient scaling
- Requires long-term commitment to tech stack
Software The Old Way
Big Releases Once Every Couple Of Years
Software The New Way
Small Building Blocks, Updated Independently

Simple / hard
Modularity based on component services
Change cycles decoupled / enables frequent deploys
Efficient scaling
Individual components less intimidating
No long-term commitment to technical stack
To Cloud Native
Software The New (Agile) Way

Small Releases Every Couple Of Weeks, Days Or Hours

DevOps: an operations model where software development principles are applied to operations
What Makes Cloud-native Apps Different?

Different Promises:

• Operate at much greater scale on much more data
• Tend to be built on microservices
• Use new models for:
  – Development
  – Deployment
  – Organizational
  – Management
• With open source components at all levels
Cloud-Native Apps Need...

Cloud-Native Infrastructure...

- **Programmability** ("infrastructure as code")
- **Elasticity** (which demands a scale-out architecture)
- **Economics** (steers toward Commodity + software-based)
- **Strong instrumentation and telemetry** of infrastructure layer
Modern Approach for Digital Business

AGILE PRODUCT DEVELOPMENT
Agile practices and collaboration for product and culture transformation

- World class application development services
- Proven transformational methodology

BIG DATA
Modern, open, highly parallelized platform

- Hadoop, in-memory, and database software
- Industries most complete big data analytics offering

CLOUD NATIVE PLATFORM
Modern, open, highly automated cloud platform

- Platform-as-a-Service (PaaS) software with multi-cloud support
- Record-breaking sales growth and adoption
Cloud-native apps are different
A new way to **develop and deliver** apps
From commit to production in 10 minutes
(at a century-old insurance company)

–Dave Ehringer, Liberty Mutual
Assembling a Cloud-native Platform is Complex
A Pre-assembled Cloud-native Platform
Curated Cloud-native Platform Product

Pivotal Cloud Foundry®
THE POWER OF PAAS

Traditional IT
- Applications
- Data
- Runtime
- Middleware
- O/S
- Virtualization
- Servers
- Storage
- Networking
You Manage

IaaS
- Applications
- Data
- Runtime
- Middleware
- O/S
- Virtualization
- Servers
- Storage
- Networking
You Manage

PaaS
- Applications
- Data
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You Manage

Agility and Cost Savings

Cloud Enablement

Pivotal CF on IaaS
DEPLOY APPLICATIONS

Install runtime and container
Install services (db, messaging, hadoop, ...)

Setup load-balancing, SSL termination and dynamic routing
Setup / config High Availability

Setup APM
Setup log streaming
DEPLOY APPLICATIONS

Deploy

cf push

App Deployed

NATIVE HYBRID CLOUD
The developer dream haiku

Here is my source code,

Run it in the Cloud for me,

I do not care how
BOSH is an open source tool for release engineering, deployment, lifecycle management, and monitoring of distributed systems.

- Packaging w/ embedded OS
- Server provisioning on any IaaS
- Software deployment across availability zones
- Health monitoring (server AND processes)
- Self-healing w/ Resurrector
- Storage management
- Rolling upgrades via canaries
- Easy scaling of clusters
“Run this app for me, I don’t care how”

Perfect for 12-Factor apps

**Platform build containers** The platform takes care of container creation and management from source code. Pivotal makes sure they’re always up-to-date.

**Out-of-box logging, metrics, tracing and monitoring.** No additional configuration required.

**Create services on demand** On-demand service brokers allow dynamic creation and binding of service dependencies, offered through a marketplace.

**Fully automated Ops.** State-of-art automation for consistent and reliable operations. Pipeline-based deployment, scale, patching and upgrades. Powered by BOSH
APPLICATION CENTRIC APPROACH

- Auto-detect frameworks
- Link to PaaS

- Self-service deploy
- Dynamic routing

- Elastic scale
- Integrated HA
- Autoscaling and APM
- Log aggregation
- Policy and Auth

- A/B versioning
- Live upgrades

- Self-service removal
PIVOTAL LAYERED APPROACH

**Culture**
- Dev
- IT Ops

**Cloud Native Framework**
- Application Framework
- Runtime Platform
- Infrastructure Automation
- Infrastructure

**Tools**
- Spring Cloud
- Spring Boot
- Cloud Foundry
- VMware
- AWS
- Azure
- openstack
OVERVIEW: ELASTIC RUN TIME WORKFLOW

1. Upload app bits and metadata
2. Create and bind services
3. Stage application
4. Deploy application

- cf push
  - push app + app MD

- Blobstore
- DB
- Service credentials
- CC + Brain
- Service Broker Node(s)
- Cell
  - + app MD = Service credentials
Cloud Native Framework

- Application Framework
- Runtime Platform
- Infrastructure Automation
- Infrastructure

Tools

- Spring Cloud
- Spring Boot
- Cloud Foundry
- VMware
- AWS
- Azure
- openstack
- Google Cloud Platform

Culture

- Dev
- IT Ops
Software developers spend too much time **NOT** writing software

<table>
<thead>
<tr>
<th>Activity</th>
<th>Average Hours/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and Coding</td>
<td>9.75</td>
</tr>
<tr>
<td>Brainstorming</td>
<td>6.5</td>
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<tr>
<td>Administrative tasks</td>
<td>3.25</td>
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<tr>
<td>Managing Environments</td>
<td>2.25</td>
</tr>
<tr>
<td>Waiting for Test/Build</td>
<td>2.25</td>
</tr>
</tbody>
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**Sources:** “Electric Cloud LinkedIn Survey to software developers”
Culture

Cloud Native Framework

Application Framework

Runtime Platform

Infrastructure Automation

Infrastructure

Dev

IT Ops

Spring Cloud

Spring Boot

Cloud Foundry

Dev

IT Ops

IT Ops

IT Ops

IT Ops

IT Ops
Spring Cloud

Designed for fragile infrastructure in partnership with Netflix

Spring Boot

From 0 to app in < 5 min
Cloud Native App Dev Framework

**Spring Boot**
- Convention-over-configuration, no XML, no code generation
- Auto-configure, embedded servlet engine
- Get out of the way quickly if you want to change defaults
- Service Binding for Cloud Foundry, Java, Spring, Groovy

**Spring Cloud**
- Runtimes and their client libraries for:
  - Service Discovery
  - Configuration Management
  - Circuit Breakers
  - Intelligent Client Side Routing
  - Reverse Proxies
  - ...and much more
- Security (encrypt, SSO, roles)
Infrastructure Automation

- manage services
- no maintenance windows
- zero downtime
- embedded OS
- infra as code
- multi cloud support

IT Ops

IT Ops
Cloud Native Framework

Culture

Cloud Provider Interface

IT Ops

IT Ops

Dev

Dev

Application Framework

Runtime Platform

Infrastructural Automation

Tools

Spring Cloud

Spring Boot

Cloud Foundry

VMware

AWS

Google Cloud Platform

Azure

openstack

Dell EMC
Pivotal-powered Cloud Platform
Cloud-native platform for new apps

Continuous integration & delivery
Self-service marketplace
Management and reporting
Scalable Object Store
Application performance management

Developer and IT Ops Services

Pivotal Cloud Foundry
Cloud-native platform

Virtualized infrastructure

Hyper-converged infrastructure
Focus on New Apps

Applications

Dell EMC & Pivotal Native Cloud

Empower developers
Accelerate innovation
Simplify support
Streamline operations

Turnkey cloud-native platform