

The background image is a photograph of the Golden Gate Bridge in San Francisco, California. The bridge is shown from a low angle, looking towards the Marin Headlands. The towers and cables of the bridge are prominent against a hazy, overcast sky. The water below is dark and reflects the bridge's structure. In the distance, the city of San Francisco is visible across the bay.

Pivotal

PCF Operations Workshop - Introduction

Dan Herold – Platform Architect

Nenad Momcilovic – Platform Architect

Operations Workshop Agenda

- PCF Introduction
- Services Overview
- Platform Installation & Setup
- Role Based Access Control
- Platform & Application Scaling
- Platform & Application Health
- Patching & Updates
- Security
- BOSH

Labs Overview

- Lab 1 – Application Deployment
- Lab 2 – PCF Services
- Lab 3 – Role Based Access Control
- Lab 4 – Scaling
- Lab 5 – Application Monitoring & Health
- Lab 6 – Blue Green Deployment

Operations Workshop Agenda

- PCF Introduction
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- Platform & Application Scaling
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- Patching & Updates
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- Advanced BOSH

What is Pivotal Cloud Foundry?

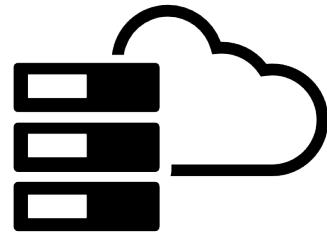


Pivotal **Cloud Foundry**[®]

Pivotal Cloud Foundry is a platform for developing and running cloud applications

Cloud Foundry Principles

<code>



Developer Productivity

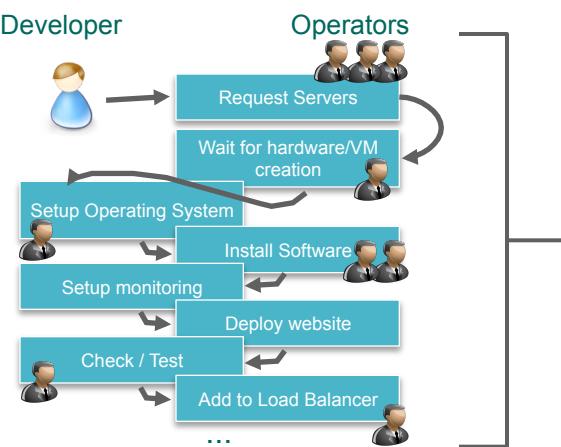
Operational Efficiency

Enhanced Security Posture

Traditional App Lifecycle: Lengthy & Complex

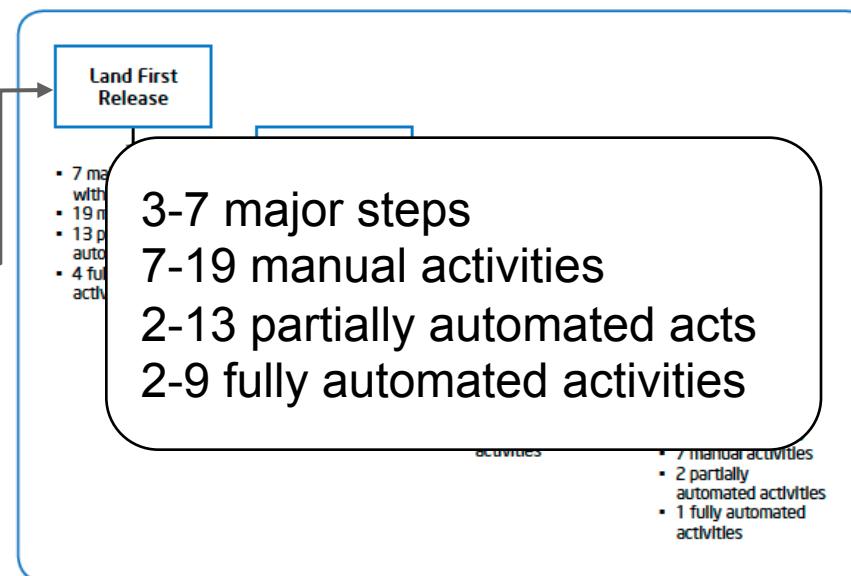
Traditional App Deployment:

8+ manual steps, developers out of the workflow

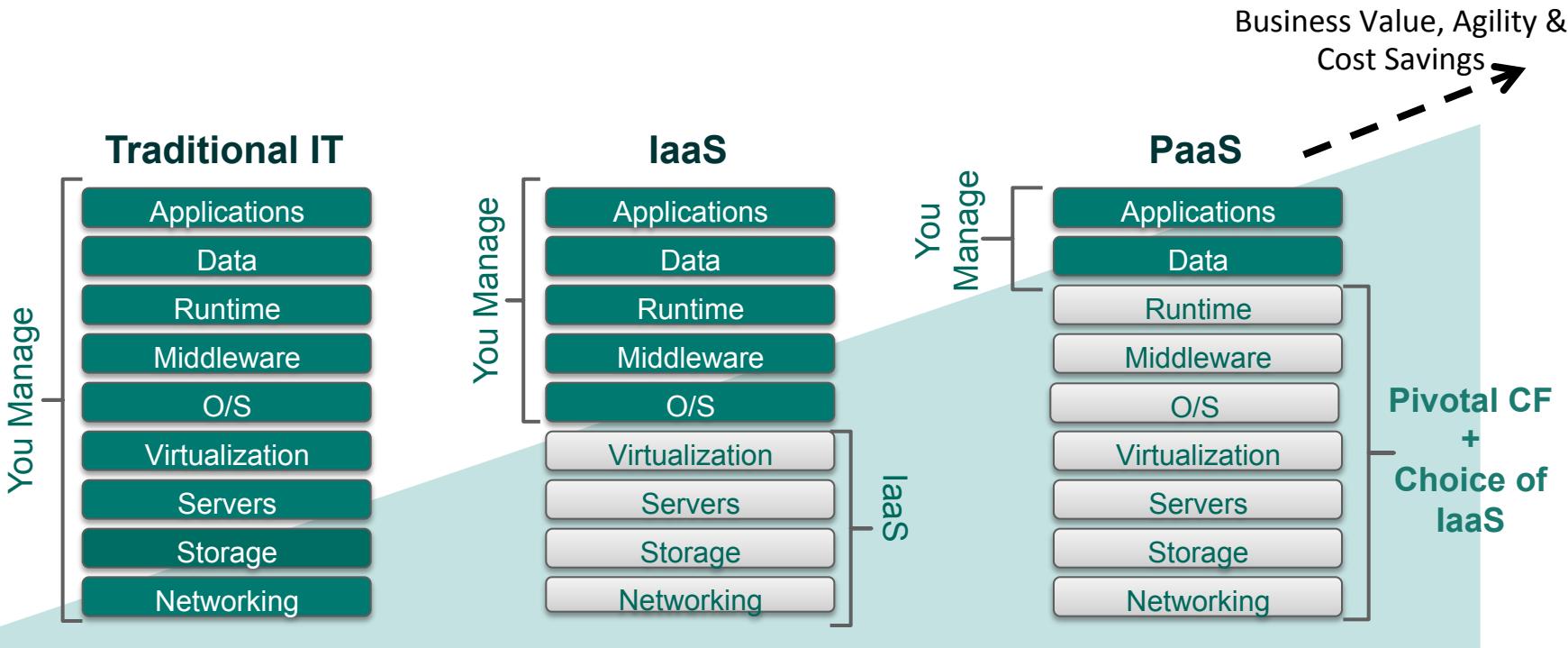


Traditional App Lifecycle:

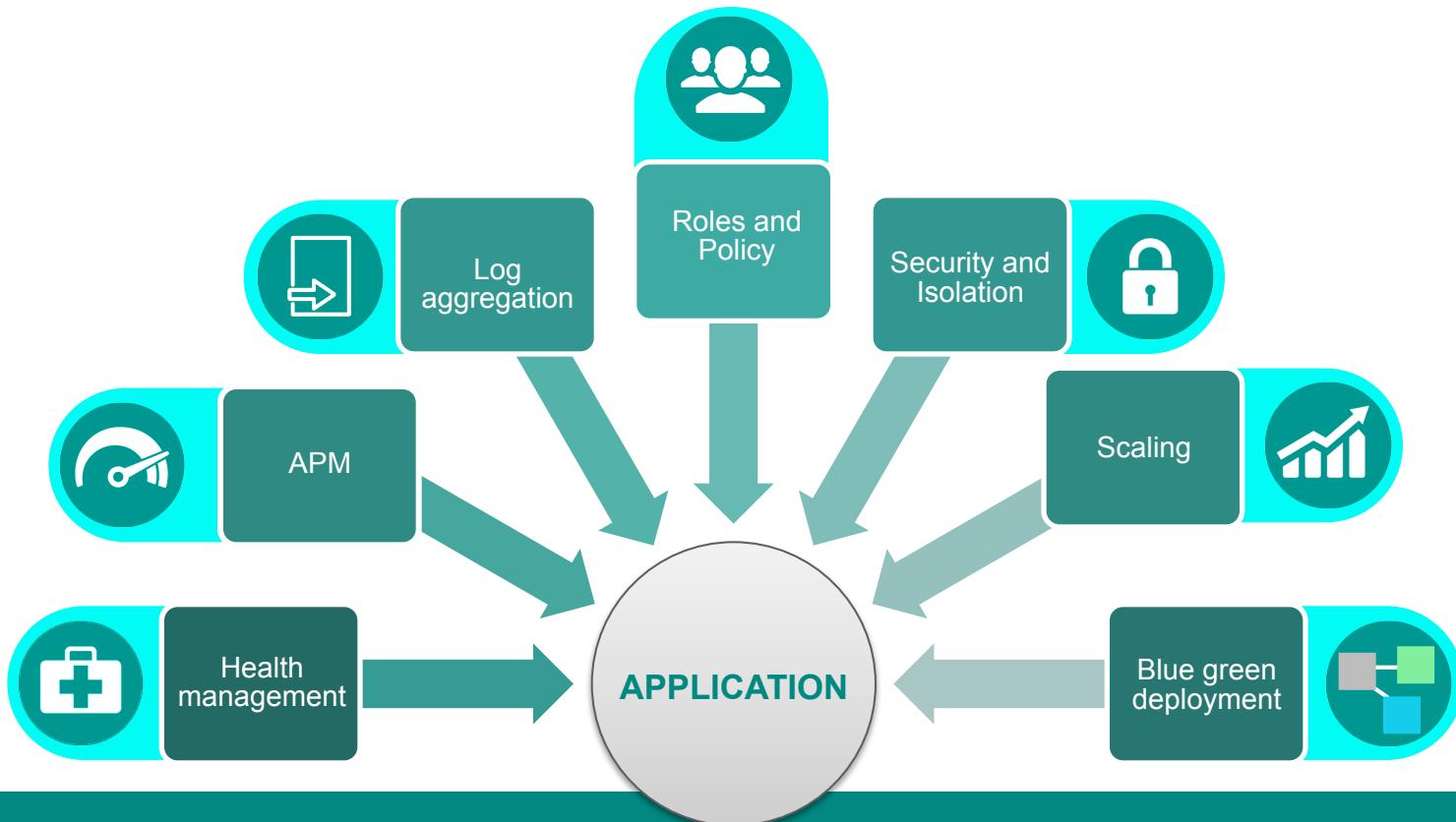
Each phase compounds time and complexity, **sacrificing agility**



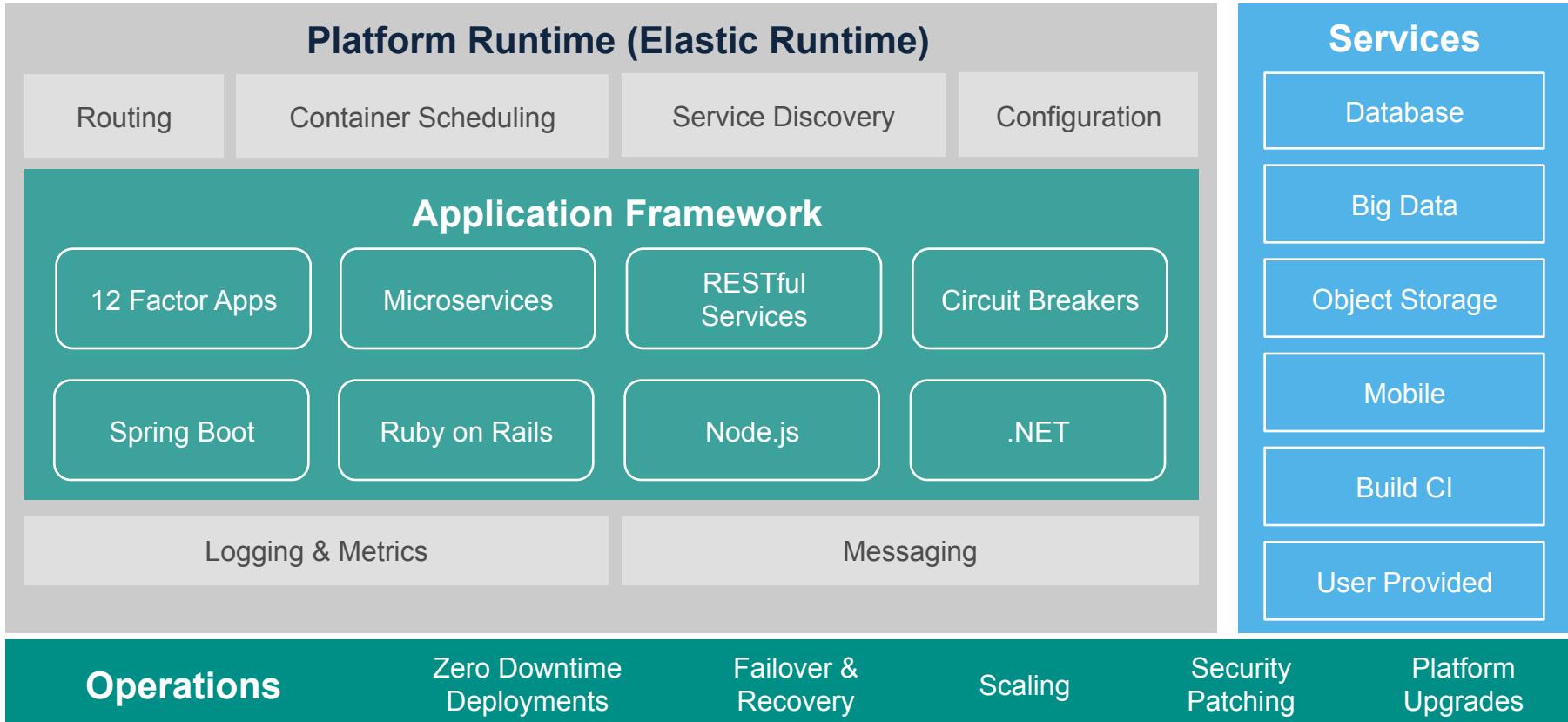
The Power of PaaS

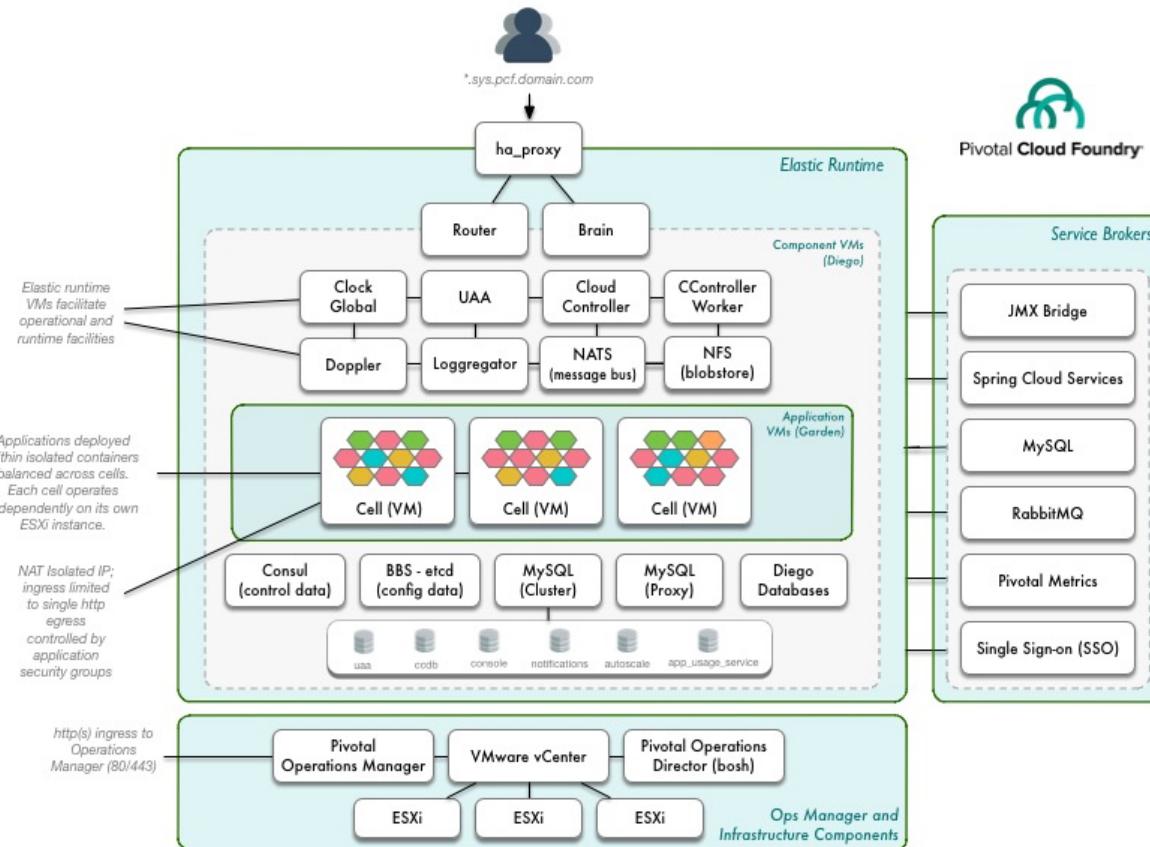


Everything to Deploy and Manage the App



Pivotal Cloud Foundry Architecture





Pivotal Cloud Foundry®

Pivotal

Deployment Flexibility



vmware
vSphere

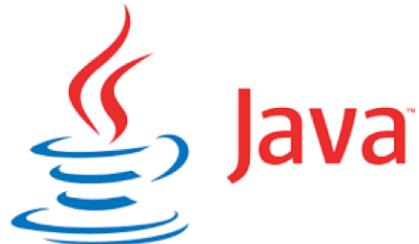


Google Cloud Platform



openstack
CLOUD SOFTWARE

Extensive Support



Pivotal Cloud Foundry Includes

- Pivotal Cloud Foundry Elastic Runtime
- OS Entitlement
- OSS Support for Spring
- OSS Support for Apache Tomcat
- Session State Caching Powered by GemFire for PCF
- Spring Cloud Services for PCF
- Pivotal tc Server
- Single Sign-on for PCF
- Push Notification for PCF
- App Distribution for PCF
- Entitlement to Push App Instances to Pivotal Web Services

The Developer Dream Haiku

Here is my source code,

Run it in the Cloud for me,

I do not care how

Interacting with Cloud Foundry

```
1. bash

NAME:
  cf - A command line tool to interact with Cloud Foundry

USAGE:
  [environment variables] cf [global options] command [arguments...] [command options]

VERSION:
  6.15.0+fa1bfe2-2016-01-13

GETTING STARTED:
  help           Show help
  login          Log user in
  logout         Log user out
  passwd         Change user password
  target         Set or view the targeted org or space

  api            Set or view target api url
  auth           Authenticate user non-interactively

APPS:
  apps           List all apps in the target space
  app            Display health and status for app

  push           Push a new app or sync changes to an existing app
  scale          Change or view the instance count, disk space limit, a
nd memory limit for an app
  delete         Delete an app
  rename         Rename an app
  start          Start an app
```

The screenshot shows the Pivotal Web Services dashboard. On the left, a sidebar navigation includes 'ORG' (set to 'nsanfratello-personal-org'), 'SPACES' (with 'development' and 'labtest' listed), 'Marketplace', 'Docs', 'Support', 'Tools', 'Blog', and 'Status'. The main content area displays the organization 'nsanfratello-personal-org' with a quota of 0% (0 MB of 2 GB) and an 'Increase Quota' button. Below this, there are tabs for 'Spaces (2)', 'Domain (1)', 'Members (2)', and 'Settings'. The 'Spaces' tab is active, showing two spaces: 'development' and 'labtest'. Each space has a table for 'APPS' and 'SERVICES'. For 'development', there is 1 APP (green dot) and 1 SERVICE (grey dot). For 'labtest', there are 0 APPS (green dot) and 0 SERVICES (red dot). Below each space table is a '0% of Org Quota' message. At the bottom right of the dashboard is a '+ Add a Space' button.

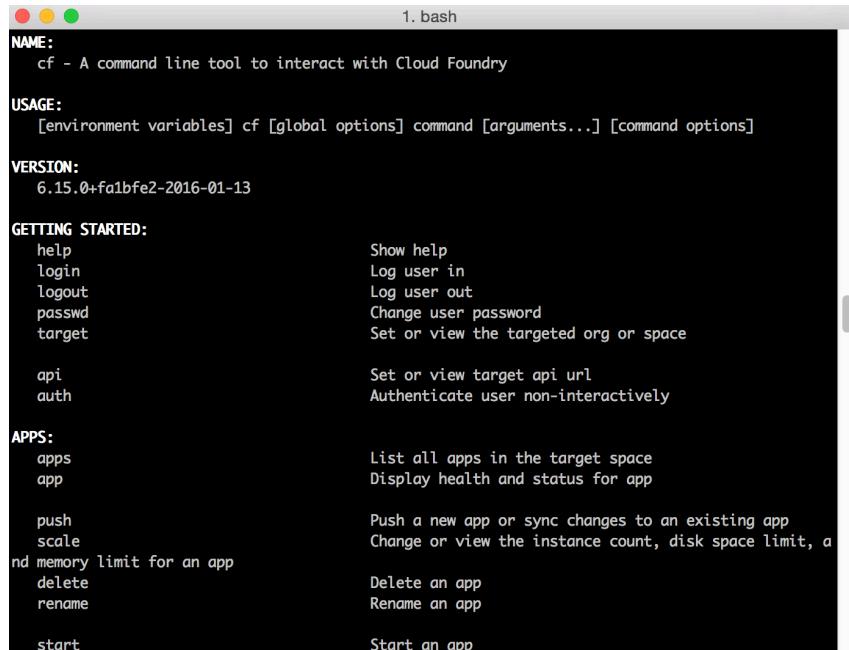
Platform Runtime – Apps Manager

- Manage organizations, users, applications and spaces
- Monitor applications logs, services, and routes
- Access Service Marketplace, create services and bind to applications

The screenshot shows the Pivotal Web Services interface for managing organizations. The top navigation bar includes the Pivotal logo, 'Pivotal Web Services', the user's email ('nsanfratello@pivotal.io'), and a 'Billing Report' link. The left sidebar has a dark theme with white text, listing 'ORG', 'nsanfratello-personal...', 'SPACES', 'development', 'labtest', 'Marketplace', 'Docs', 'Support', 'Tools', 'Blog', and 'Status'. The main content area displays the 'nsanfratello-personal-org' organization details. It shows a quota of 0% (0 MB of 2 GB) with a 'Increase Quota' button. Below this are tabs for 'Spaces (2)', 'Domain (1)', 'Members (2)', and 'Settings'. Under 'Spaces', there are two entries: 'development' and 'labtest'. Each space entry shows the number of 'APPS' (green dot) and 'SERVICES' (red dot). For 'development', there is 1 APP and 1 SERVICE. For 'labtest', there are 0 APPS and 0 SERVICES. Below each space summary is a '0% of Org Quota' message. At the bottom of the space list is a button labeled '+ Add a Space'.

CLI

- Command line utility providing easy access to the Pivotal CF commands.
- Scriptable
- Fully documented via the “cf help” command



```
1. bash
NAME:
cf - A command line tool to interact with Cloud Foundry

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[environment variables] cf [global options] command [arguments...] [command options]

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scale                                         Change or view the instance count, disk space limit, a
nd memory limit for an app
delete                                        Delete an app
rename                                         Rename an app
start                                         Start an app
```

Cloud Controller API

- Cloud Controller component of Elastic Runtime manages all Cloud Foundry APIs
- CF CLI and other clients like Apps Manager directly call this API
- Before accessing the CC API, you must get an access token from the ERS component called User Account and Authentication (UAA) server
- <http://apidocs.cloudfoundry.org>

Home Version 238 - CC API VERSION 2.57.0 ▾ Version 3 - Experimental

Cloud Foundry API

App Usage Events

- List all App Usage Events
- Purge and reseed App Usage Events
- Retrieve a Particular App Usage Event

Apps

- Associate Route with the App
- Copy the app bits for an App
- Creating a Docker App (experimental)
- Creating an App
- Delete a Particular App
- Downloads the bits for an App
- Downloads the staged droplet for an App
- Get App summary
- Get detailed stats for a STARTED App
- Get the env for an App
- Get the instance information for a STARTED App
- List all Apps
- List all Routes for the App
- List all Service Bindings for the App
- Remove Route from the App
- Remove Service Binding from the App
- Restage an App
- Retrieve a Particular App
- Terminate the running App Instance at the given index
- Updating an App
- Uploads the bits for an App

Blobstores

Deploying Apps Shouldn't Be Painful

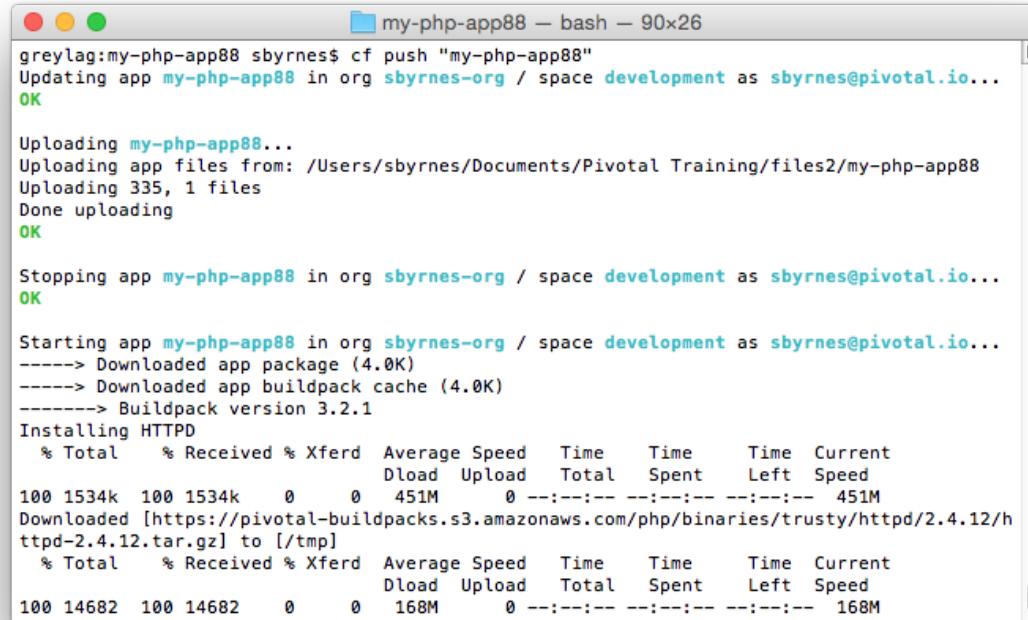
Traditional

- Create a VM
- Install JDK
- Install Tomcat
- Deploy Application
- Configure Load Balancer
- Configure DNS
- Configure Firewall
- Configure Monitoring
- Configure Logging

Pivotal Cloud Foundry

`cf push`

Deploying an App



A terminal window titled "my-php-app88 - bash - 90x26" showing the deployment of an application. The session starts with pushing the application, followed by stopping it, then starting it again, and finally displaying buildpack activity.

```
greylag:my-php-app88 sbyrnes$ cf push "my-php-app88"
Updating app my-php-app88 in org sbyrnes-org / space development as sbyrnes@pivotal.io...
OK

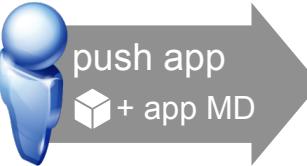
Uploading my-php-app88...
Uploading app files from: /Users/sbyrnes/Documents/Pivotal Training/files2/my-php-app88
Uploading 335, 1 files
Done uploading
OK

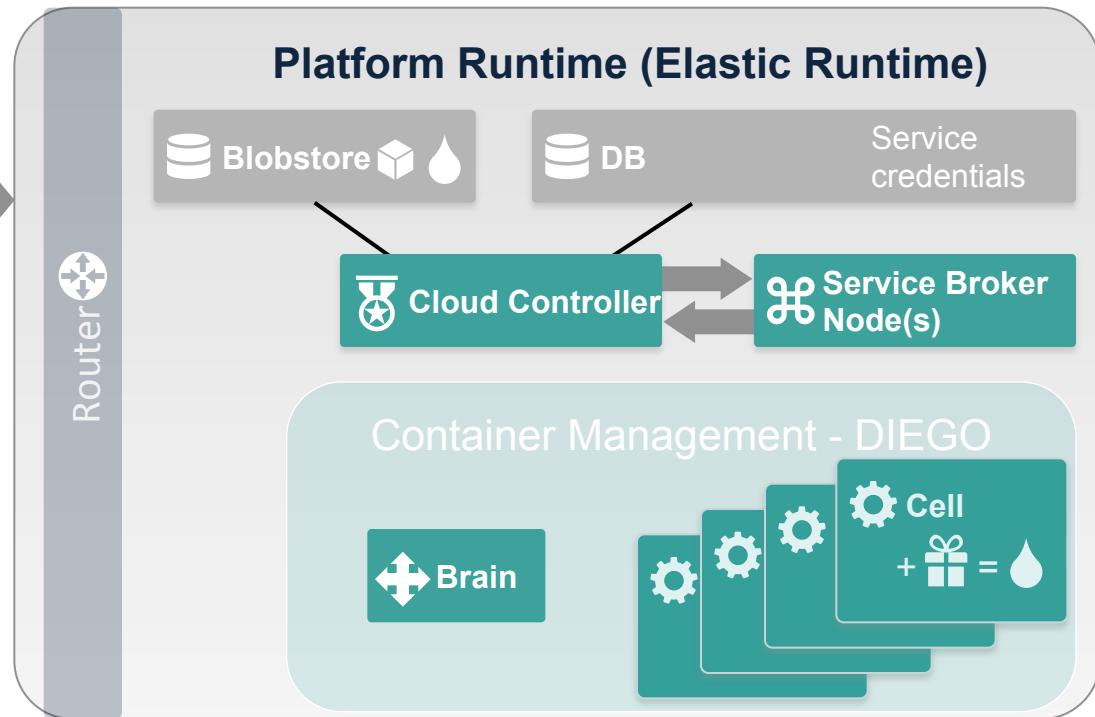
Stopping app my-php-app88 in org sbyrnes-org / space development as sbyrnes@pivotal.io...
OK

Starting app my-php-app88 in org sbyrnes-org / space development as sbyrnes@pivotal.io...
----> Downloaded app package (4.0K)
----> Downloaded app buildpack cache (4.0K)
-----> Buildpack version 3.2.1
Installing HTTPD
  % Total    % Received % Xferd  Average Speed   Time     Time      Current
          Dload  Upload Total Spent   Left Speed
100 1534k  100 1534k    0     0   451M      0 --:--:-- --:--:-- 451M
Downloaded [https://pivotal-buildpacks.s3.amazonaws.com/php/binaries/trusty/httpd/2.4.12/h
ttd-2.4.12.tar.gz] to [/tmp]
  % Total    % Received % Xferd  Average Speed   Time     Time      Current
          Dload  Upload Total Spent   Left Speed
100 14682  100 14682    0     0   168M      0 --:--:-- --:--:-- 168M
```

cf push “my-application-name”

Deploying an Application

- ① Upload app bits and metadata 
- ② Create and bind services
- ③ Stage application
- ④ Deploy application
- ⑤ Manage application health



Application Manifest

- A client-side file that describes the application deployment options
 - Provides repeatability when pushing applications
 - Same options as cf push command
- cf push automatically detects “manifest.yml” file in current working directory
 - file name can be overridden with –f flag (cf push –f mymanifest.yml)

YAML Format

- Three dashes
 - Indicate start of document
- Indent with spaces, not tabs!
 - Determines hierarchy
 - Each indent 2 spaces
 - “-” defines “group”
- property-value pairs
- # starts a one line comment
- See
<http://www.yaml.org/spec/1.2/spec.html>

```
---
```

```
applications:
```

```
- name: nodetestdh01
```

```
    memory: 64M
```

```
    instances: 2
```

```
    host: crn      # comment
```

```
    domain: cfapps.io
```

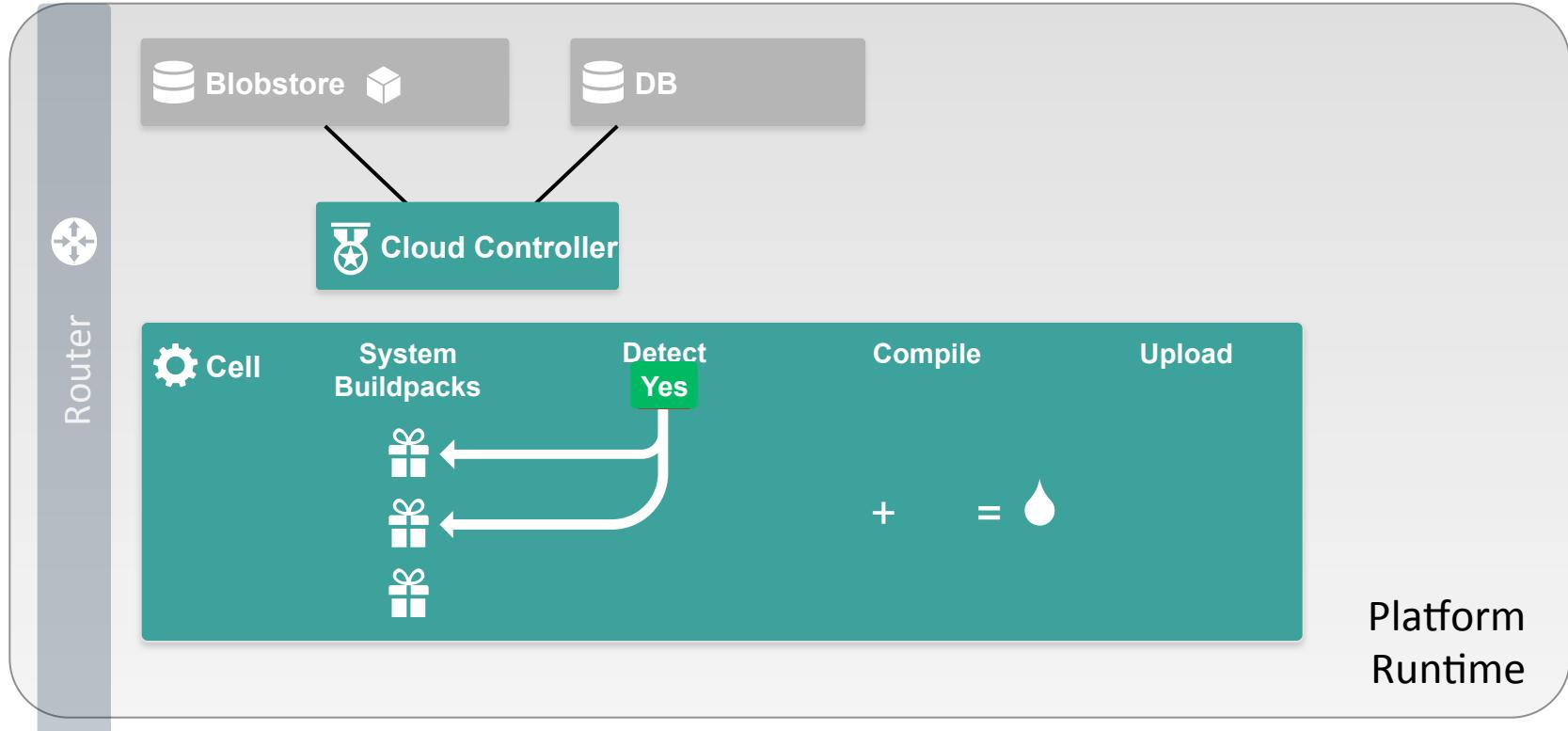
```
      # comment
```

```
- name: nextapp      # group 2
```

```
    memory: 256M
```

```
    ...
```

Staging an Application



Buildpacks

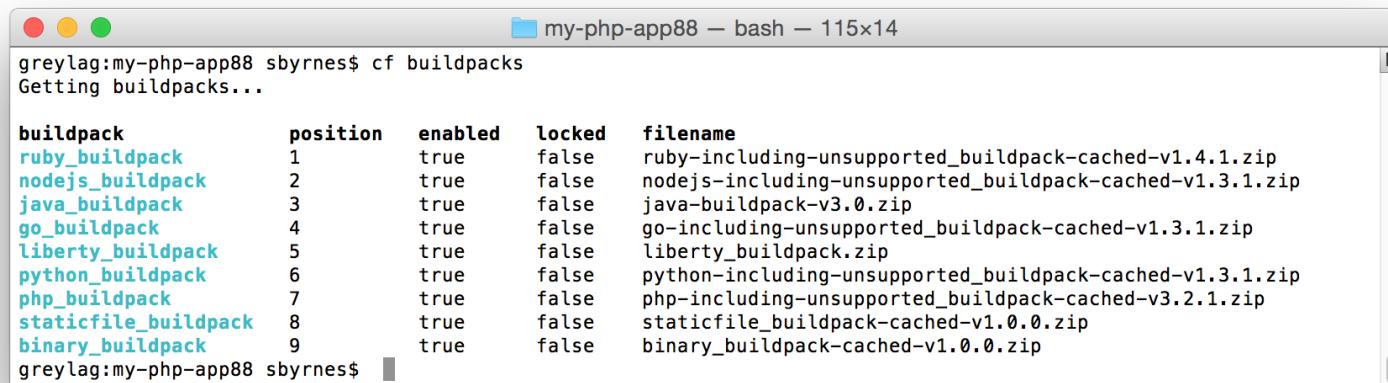
- Buildpacks are used to detect the type of application and set up the proper execution environment
- Buildpacks will download the necessary dependencies.
- Buildpacks are used at staging time (during a cf push or cf restage)
 - They are not involved during the actual execution of the app

Why Buildpacks

- Control what frameworks/runtimes are used on the platform
- Provides consistent deployments across environments
 - Stops deployments from piling up at operation's doorstep
 - Enables a self-service platform
- Eases ongoing operations burdens:
 - Security vulnerability is identified
 - Subsequently fixed with a new buildpack release
 - Restage applications

Viewing the Available Buildpacks

- Use cf buildpacks to view the system/installed buildpacks
- Buildpacks can be written for any language
- Cloud Foundry is language agnostic
- You can also specify a system or custom buildpack with cf push -b



```
my-php-app88 ~ 115x14
greylag:my-php-app88 sbyrnes$ cf buildpacks
Getting buildpacks...



| buildpack            | position | enabled | locked | filename                                                 |
|----------------------|----------|---------|--------|----------------------------------------------------------|
| ruby_buildpack       | 1        | true    | false  | ruby-including-unsupported_buildpack-cached-v1.4.1.zip   |
| nodejs_buildpack     | 2        | true    | false  | nodejs-including-unsupported_buildpack-cached-v1.3.1.zip |
| java_buildpack       | 3        | true    | false  | java-buildpack-v3.0.zip                                  |
| go_buildpack         | 4        | true    | false  | go-including-unsupported_buildpack-cached-v1.3.1.zip     |
| liberty_buildpack    | 5        | true    | false  | liberty_buildpack.zip                                    |
| python_buildpack     | 6        | true    | false  | python-including-unsupported_buildpack-cached-v1.3.1.zip |
| php_buildpack        | 7        | true    | false  | php-including-unsupported_buildpack-cached-v3.2.1.zip    |
| staticfile_buildpack | 8        | true    | false  | staticfile_buildpack-cached-v1.0.0.zip                   |
| binary_buildpack     | 9        | true    | false  | binary_buildpack-cached-v1.0.0.zip                       |


greylag:my-php-app88 sbyrnes$
```