Microservices with Pivotal CF and Spring Cloud

Lab and Overview

Jeff Holmes
Pivotal Cloud Platform Roadshow

Pivotal

© Copyright 2014 Pivotal. All rights reserved.

Continuous Delivery

Feedback → Rapid Iteration

Software Factories

Horizontal Scale

Diversity of Clients

Physical/Virtual

Pivotal CF

Infrastructure

Applications

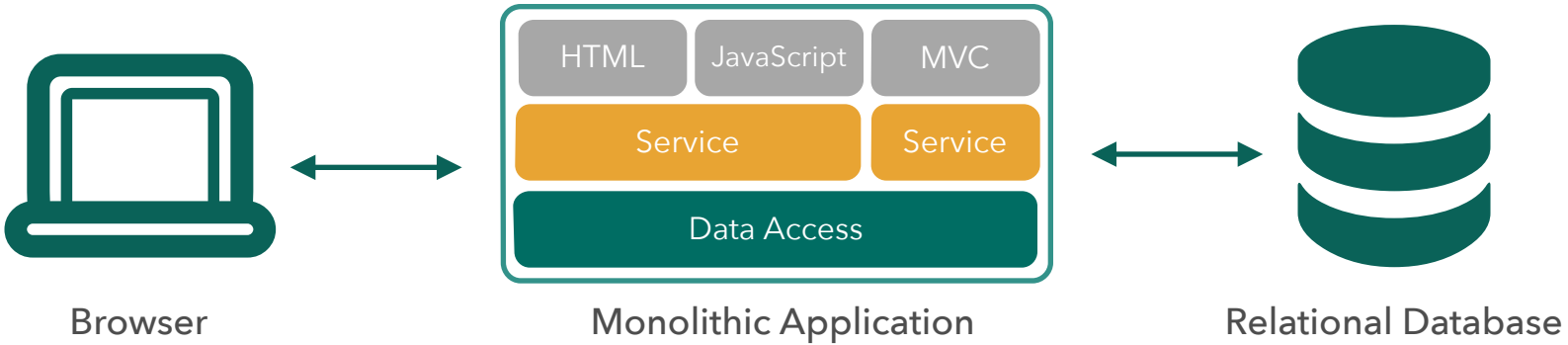
Monoliths

Microservices

Pivotal

© Copyright 2014 Pivotal. All rights reserved.

Monolithic Architecture



© Copyright 2014 Pivotal. All rights reserved.

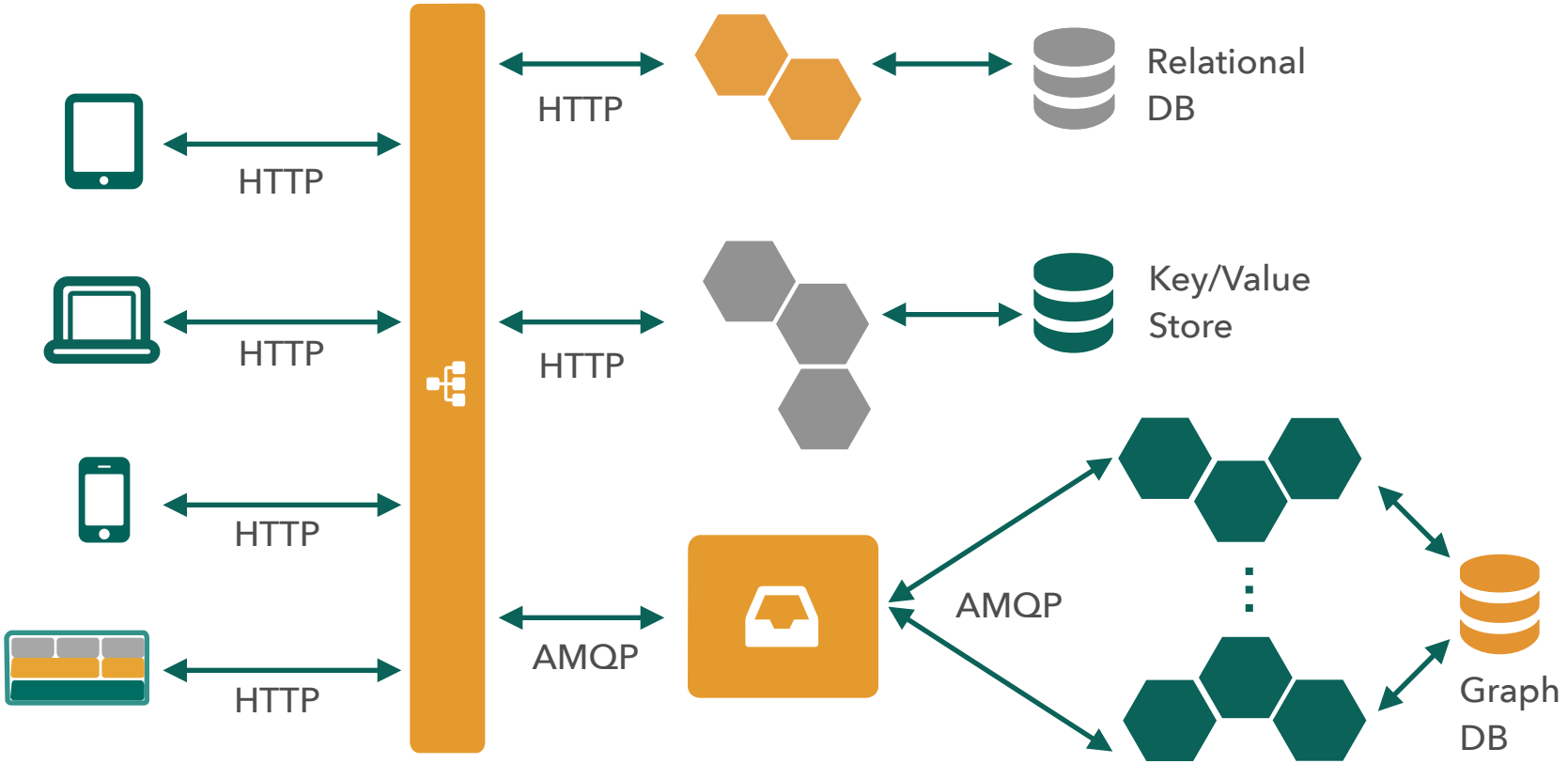
Monolithic Architectures

- Modularity Dependent Upon Language / Frameworks
- Change Cycles Tightly Coupled / Obstacle to Frequent Deploys
- Inefficient Scaling
- Can Be Intimidating to New Developers
- Obstacle to Scaling Development
- Requires Long-Term Commitment to Technical Stack

Pivotal

© Copyright 2014 Pivotal. All rights reserved.

Microservice Architecture



Pivotal

© Copyright 2014 Pivotal. All rights reserved.

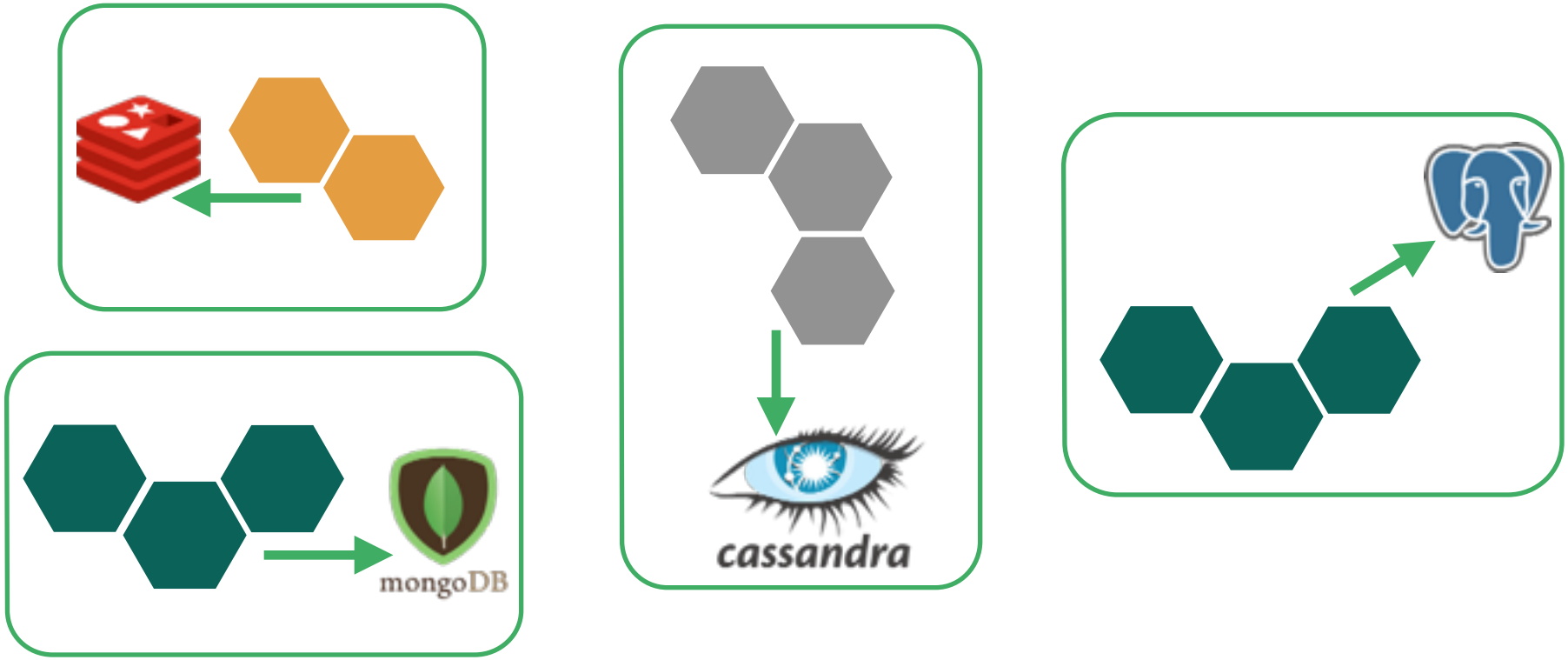
Microservice Architectures

- Modularity Based on Component Services
- Change Cycles Decoupled / Enable Frequent Deploys
- Efficient Scaling
- Individual Components Less Intimidating to New Developers
- Enables Scaling of Development
- Eliminates Long-Term Commitment to Technical Stack

Pivotal

© Copyright 2014 Pivotal. All rights reserved.

Polyglot Persistence

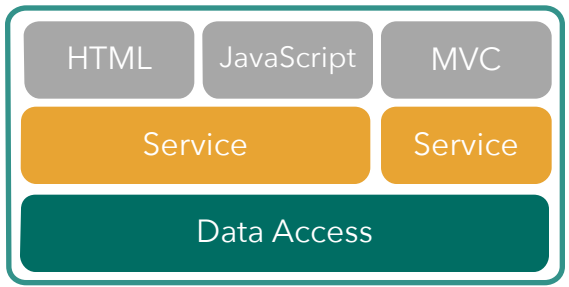


© Copyright 2014 Pivotal. All rights reserved.

Organize Around Business Capabilities

Siloed Functional Teams

Siloed Application Architectures



Cross-functional Teams

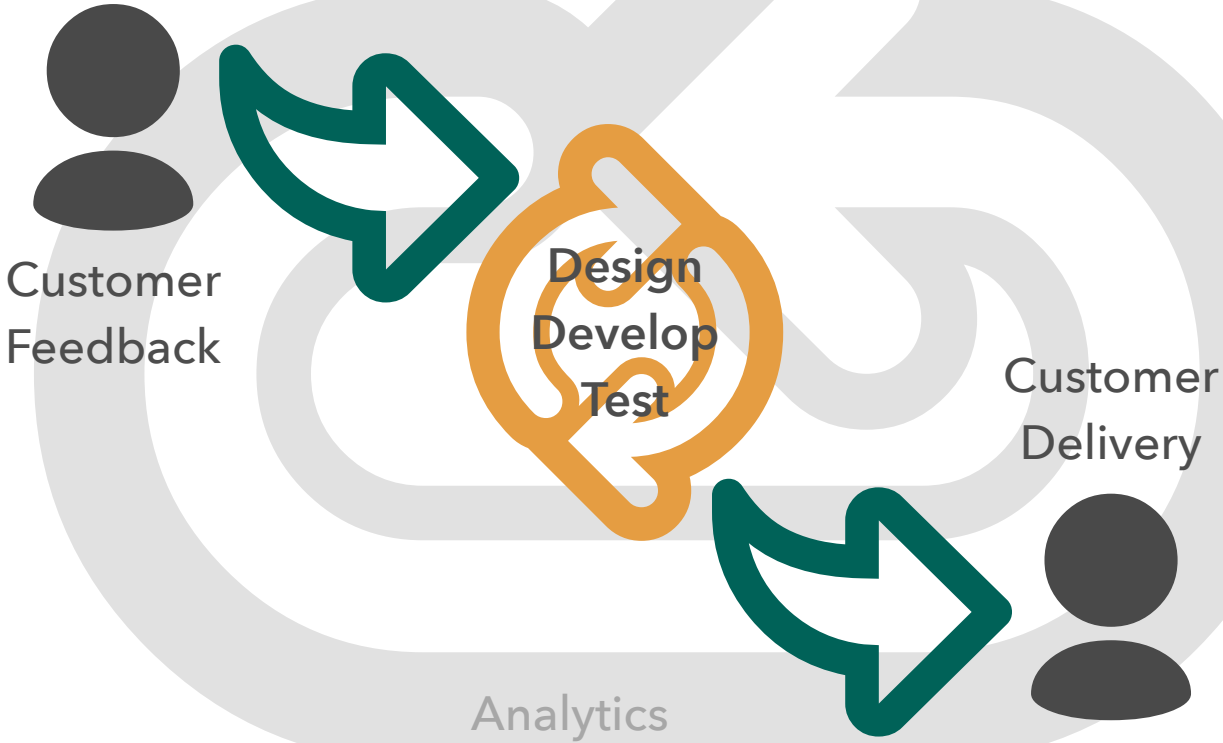
Microservice Architectures

http://martinfowler.com/articles/microservices.html#OrganizedAroundBusinessCapabilities

Pivotal

© Copyright 2014 Pivotal. All rights reserved.

Iterative Development and Continuous Delivery



Pivotal

© Copyright 2014 Pivotal. All rights reserved.

UNIX Pipes and Filters

```
cut -d" " -f1 < access.log | sort | uniq -c | sort -rn | less
```

Pivotal

© Copyright 2014 Pivotal. All rights reserved.

High Scalability

Building bigger, faster, more reliable websites.

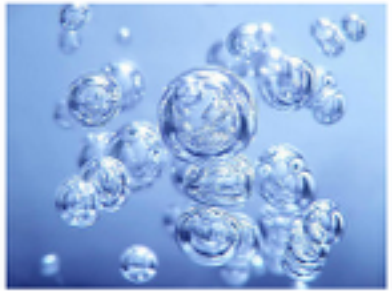
Home Real Life Architectures Strategies All Posts Advertising Book Store Start Here Contact
All Time Favorites RSS Twitter Facebook G+

« Paper: Scalable Atomic Visibility with RAMP Transactions - Scale Linearly to 100 Servers | Main | Google Finds: Centralized Control, Distributed Data Architectures Work Better than Fully Decentralized Architectures »

Microservices - Not A Free Lunch!

TUESDAY, APRIL 8, 2014 AT 8:54AM

This is a guest post by Benjamin Wootton, CTO of Contino, a London based consultancy specialising in applying DevOps and Continuous Delivery to software delivery projects.



Microservices are a style of software architecture that involves delivering systems as a set of very small, granular, independent collaborating services.

APPDYNAMICS
Get Complete Browser to Backend Visibility For Your App
FREE TRIAL
CLOUD MONITORING SIMPLIFIED
ONLINE CONTINUOUS BACKUP OF mongoDB
Messaging Giant Replacing MongoDB with Couchbase.
Couchbase
See Customer Video
LogicMonitor
HASSLE-FREE MONITORING
TRY IT FREE
Site24x7.com

http://highscalability.com/blog/2014/4/8/microservices-not-a-free-lunch.html

Pivotal

© Copyright 2014 Pivotal. All rights reserved.

It’s gonna take a platform…

Pivotal CF

Spring Cloud

© Copyright 2014 Pivotal. All rights reserved.

Platform Features

- Environment Provisioning
- On-Demand/Automatic Scaling
- Failover/Resilience
- Routing/Load Balancing
- Data Service Operations
- Monitoring

- Distributed/Versioned Config
- Service Registration/Discovery
- Routing/Load Balancing
- Service Integration
- Fault Tolerance
- Asynchronous Messaging

Pivotal

© Copyright 2014 Pivotal. All rights reserved.

Microservices Lab Instructions

https://github.com/jholmes2001/cf-workshop-ms-module

github.com /

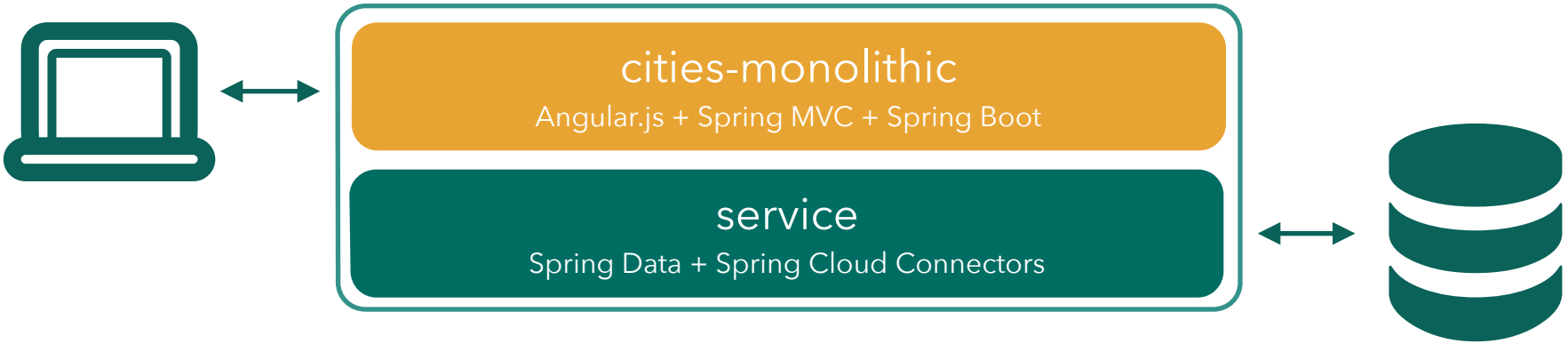
jholmes2001 /

cf-workshop-ms-module

Pivotal

© Copyright 2014 Pivotal. All rights reserved.

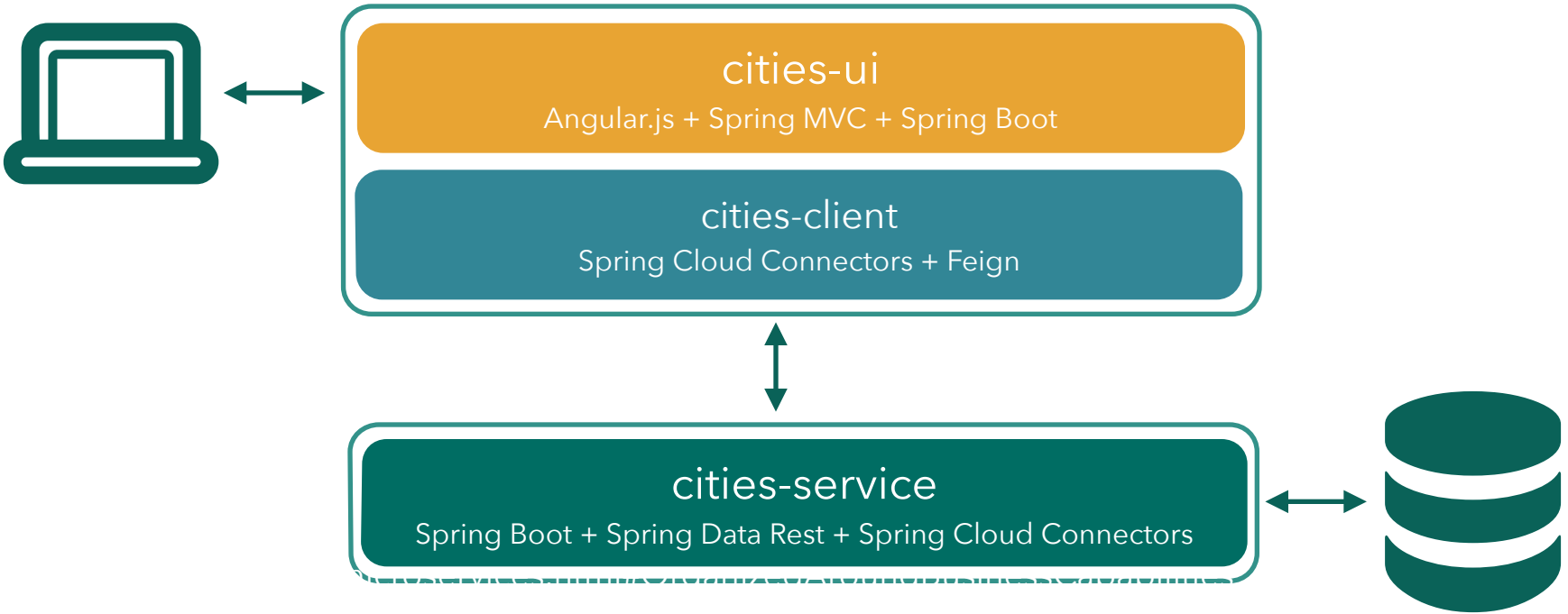
Step 1: Push v1 Monolithic App



Pivotal

© Copyright 2014 Pivotal. All rights reserved.

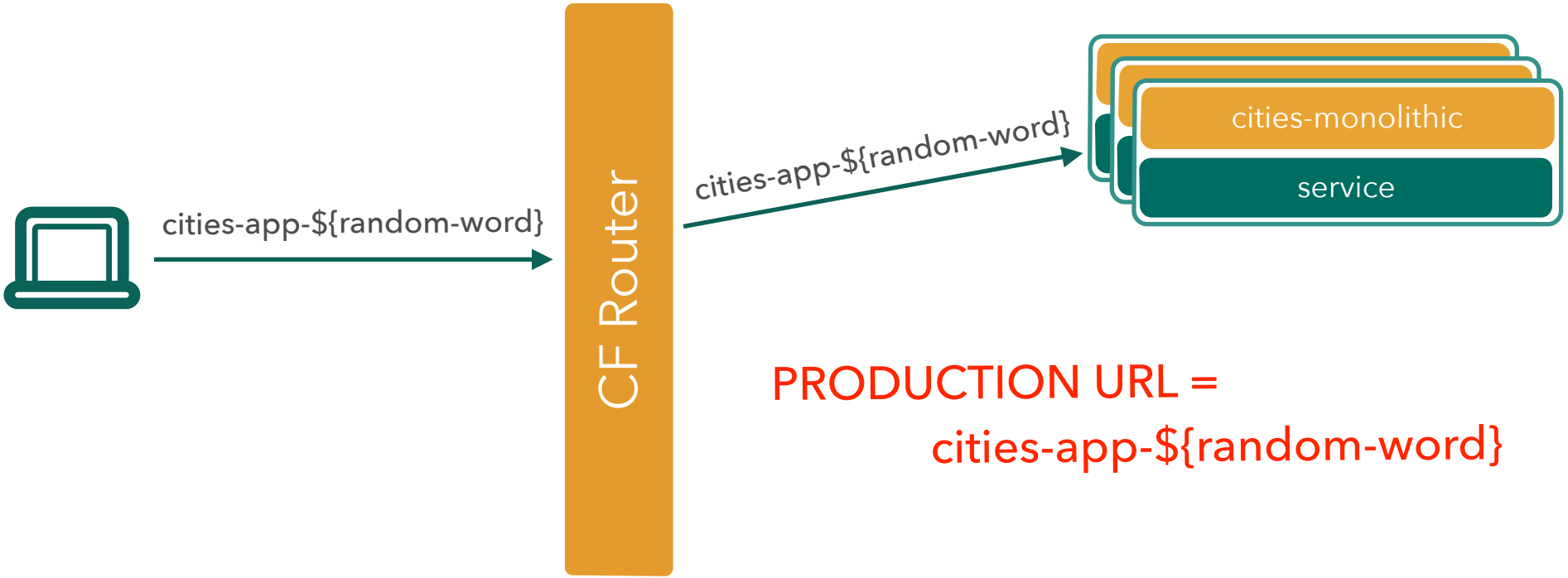
Step 2: Push Refactored v2 Microservices App



Pivotal

© Copyright 2014 Pivotal. All rights reserved.

Step 3: Perform Blue/Green Deployment

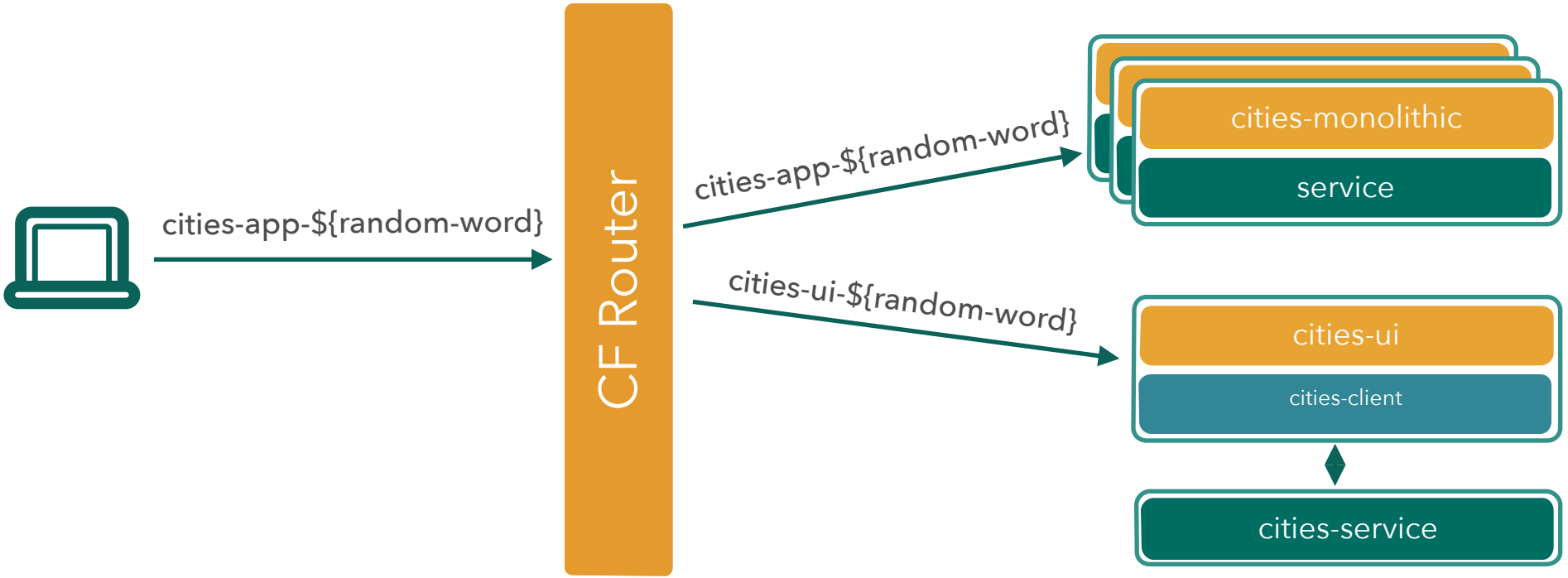


PRODUCTION URL =
cities-app-${random-word}

Pivotal

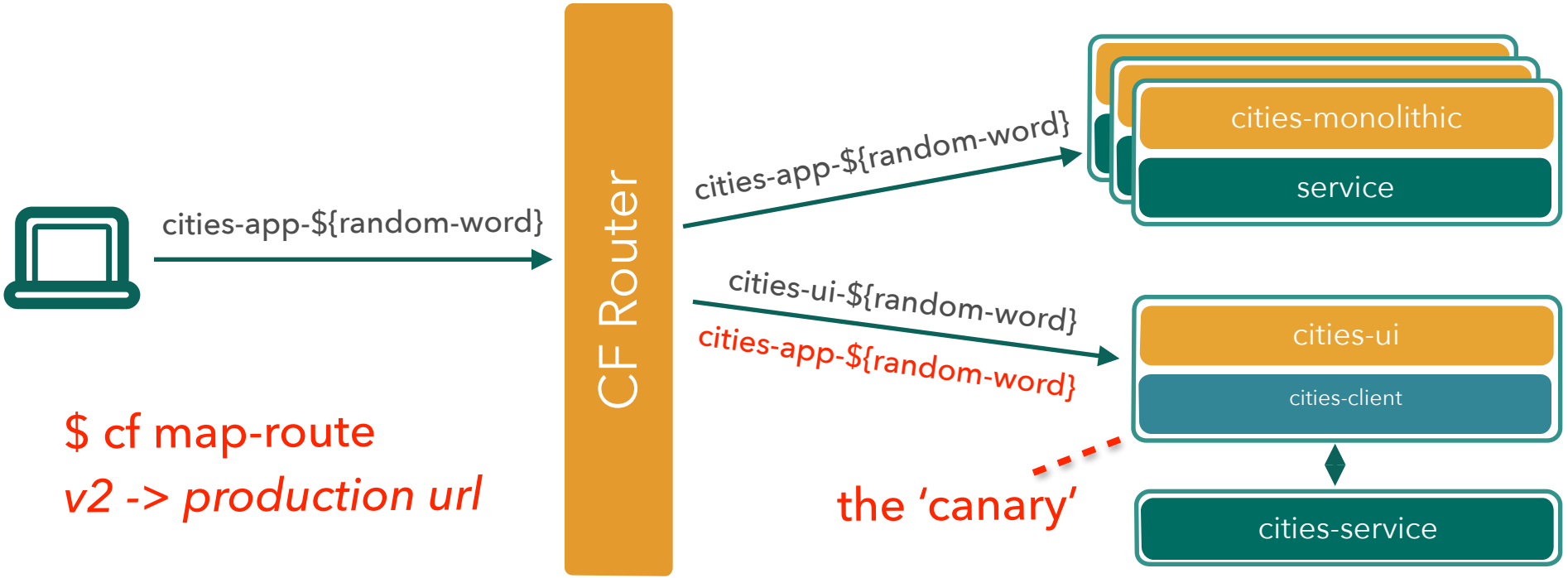
© Copyright 2014 Pivotal. All rights reserved.

Step 3: Perform Blue/Green Deployment



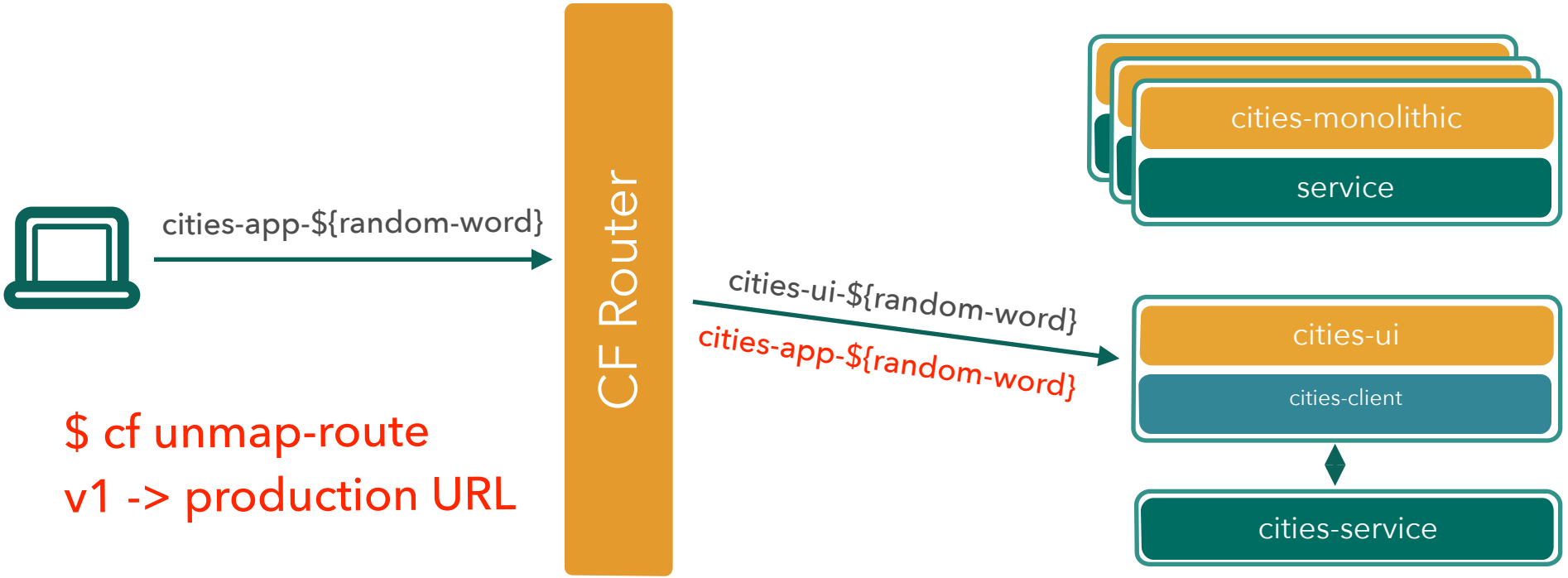
© Copyright 2014 Pivotal. All rights reserved.

Step 3: Perform Blue/Green Deployment



© Copyright 2014 Pivotal. All rights reserved.

Step 3: Perform Blue/Green Deployment

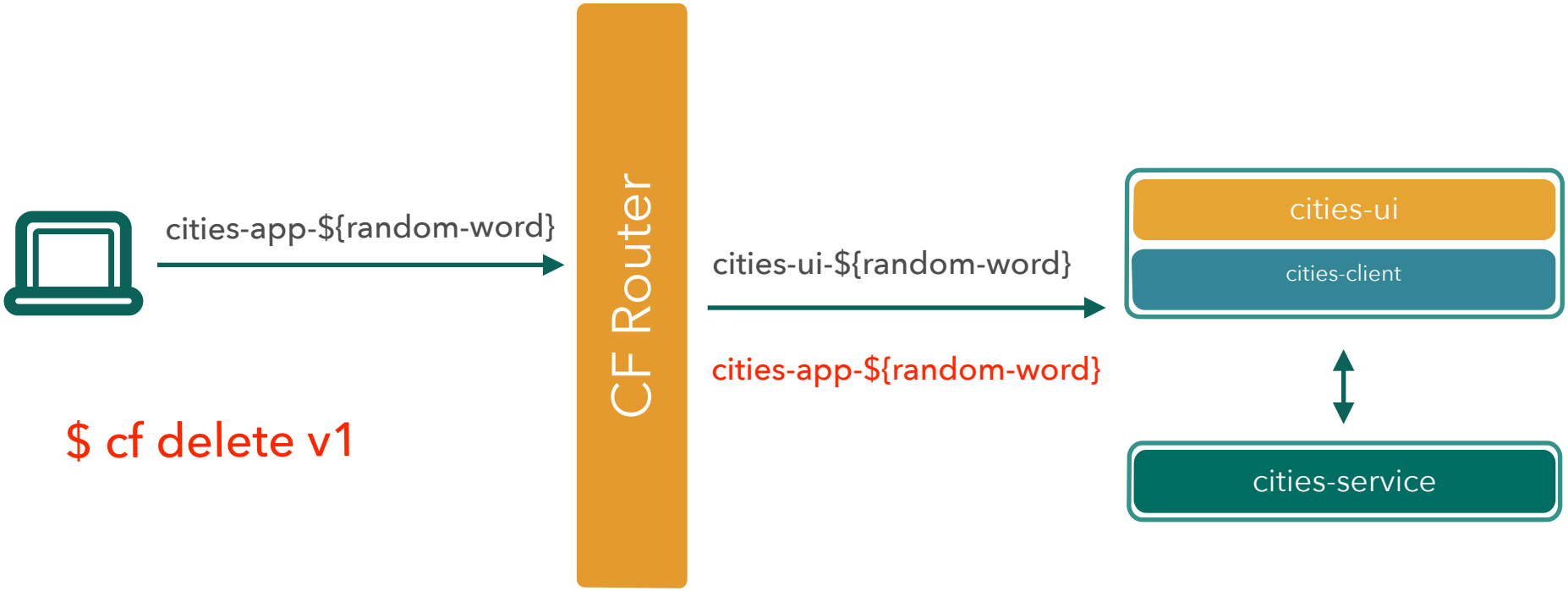


$ cf unmap-route
v1 -> production URL

Pivotal

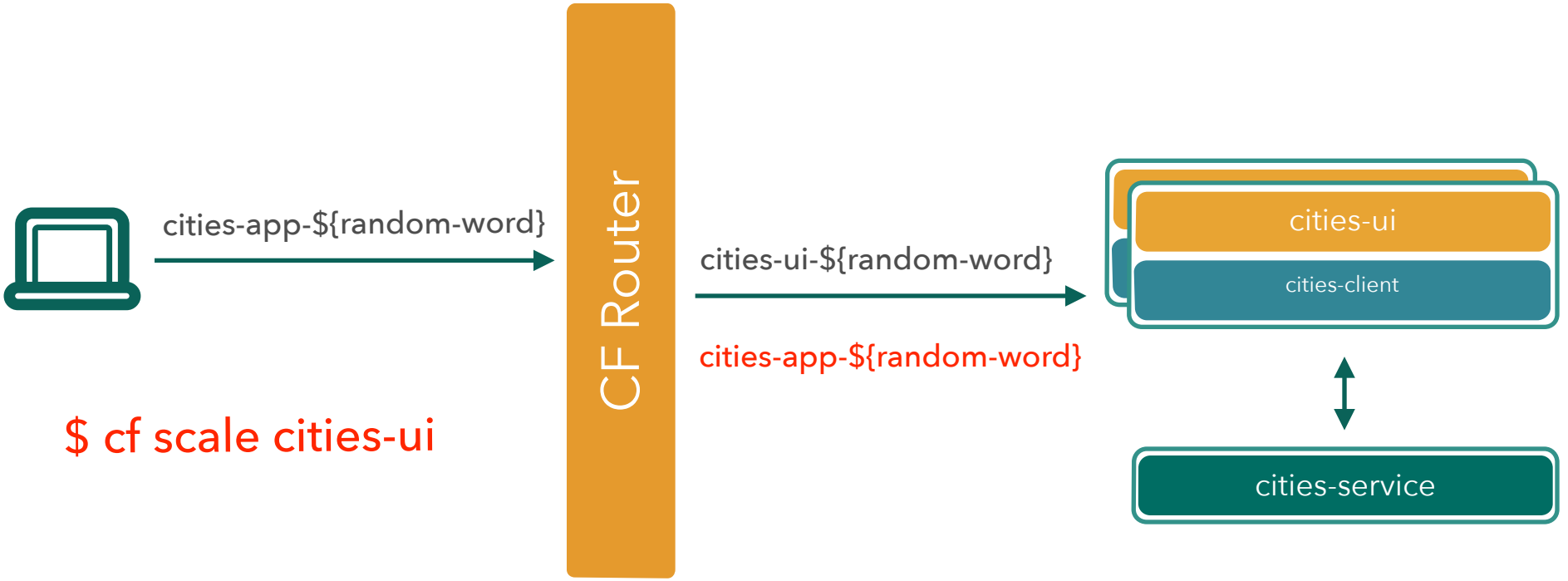
© Copyright 2014 Pivotal. All rights reserved.

Step 3: Perform Blue/Green Deployment



© Copyright 2014 Pivotal. All rights reserved.

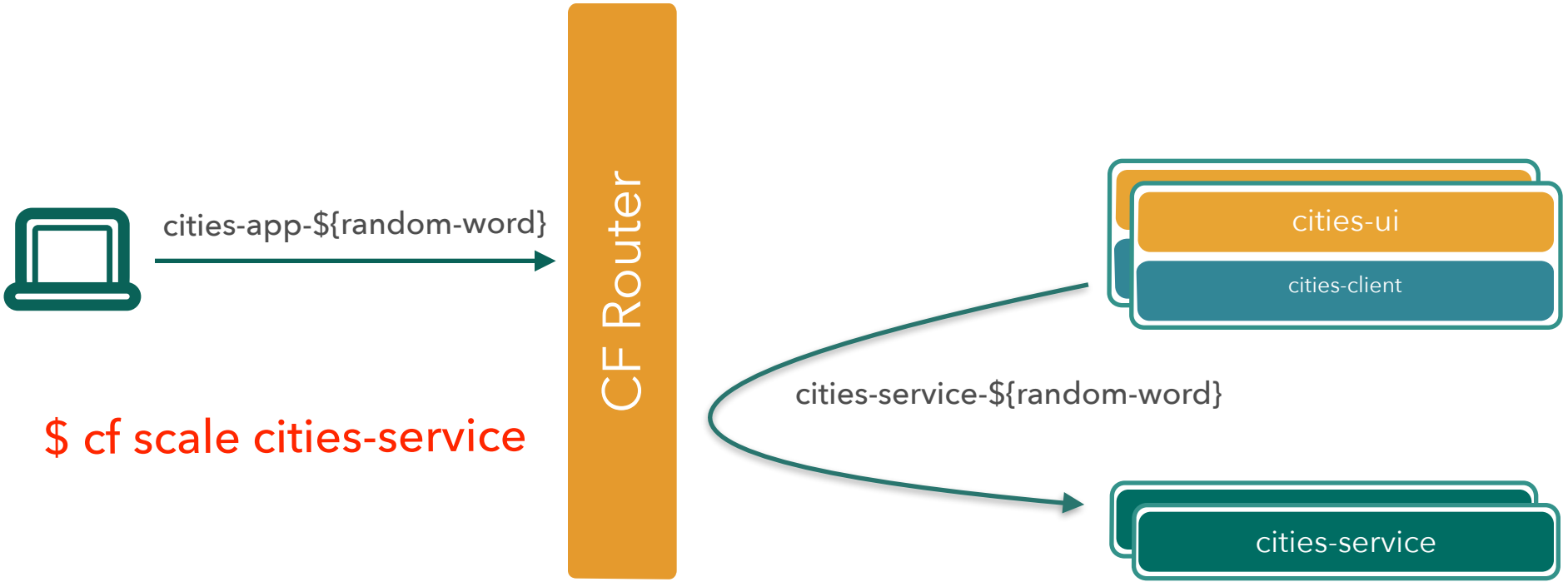
Scale/Push the UI App Independently



Pivotal

© Copyright 2014 Pivotal. All rights reserved.

Scale/Push the Service Independently



$ cf scale cities-service

Pivotal

© Copyright 2014 Pivotal. All rights reserved.

Microservices Lab Instructions

https://github.com/jholmes2001/cf-workshop-ms-module

github.com /

jholmes2001 /

cf-workshop-ms-module

Pivotal

© Copyright 2014 Pivotal. All rights reserved.

A NEW PLATFORM FOR A NEW ERA