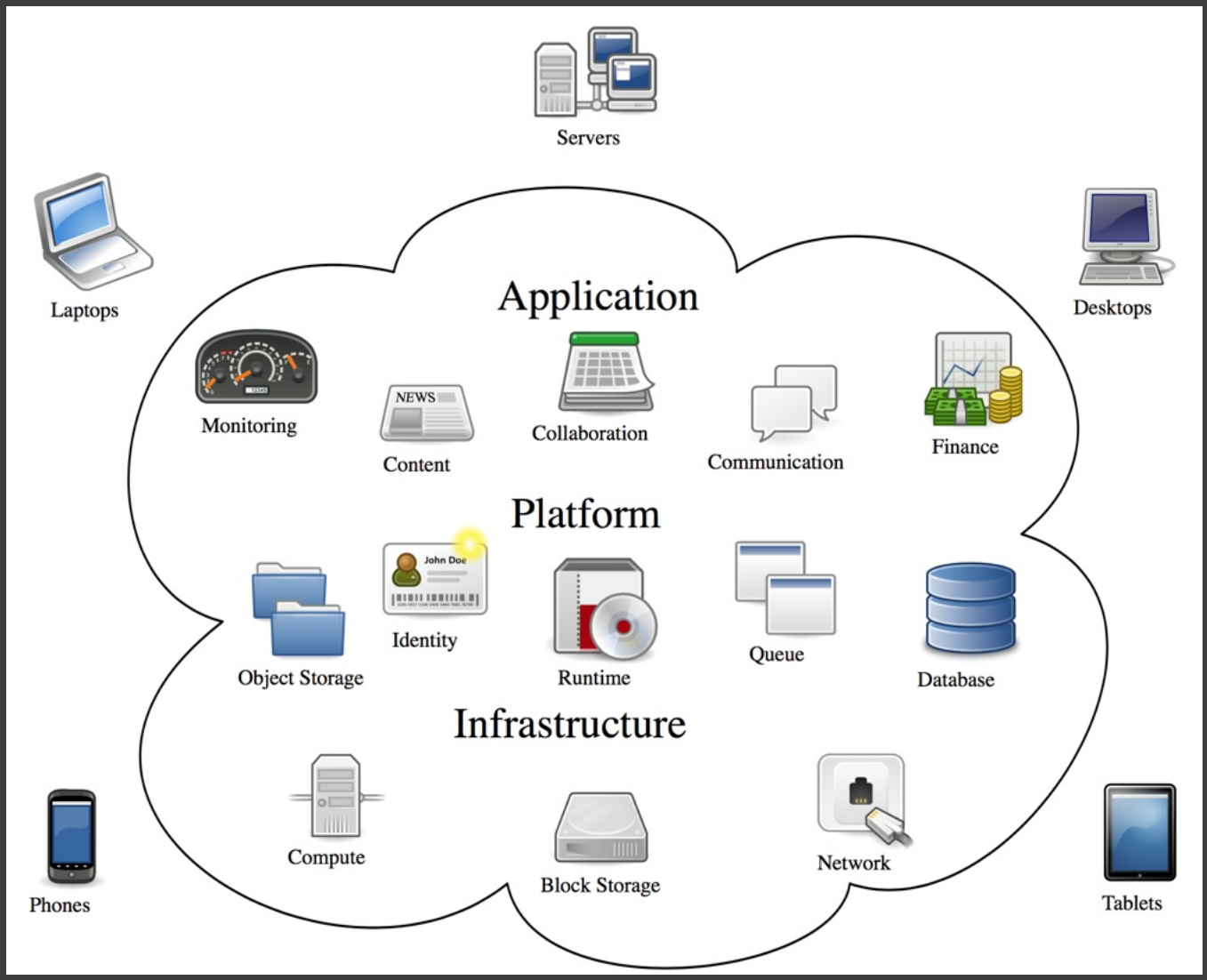


# REVENGE OF THE QUIZ

## IN THE CLOUD

CADEC 2016 - Peter Larsson

# TASK: ARCHITECT FOR THE CLOUD & PAAS



# GOAL: BUILD PORTABLE CLOUD APPS

99,999% uptime, i.e. 5,26 min downtime/year:

- **Fault-tolerant**  
resilient to outages of power, data centers, networks, servers and backing services
- **Upgradeable**  
rolling updates, blue/green & canary deployments, portable
- **Scalable**  
elasticity and auto scaling
- **Monitored**  
dashboards, alarms and troubleshooting
- **Secure**  
access management, traceability, data integrity & confidentiality, disaster recovery

Public, Private & Hybrid Cloud Solutions

# APP. ARCHITECTURE

# HOW: TWELVE-FACTOR APP.

A methodology for building SaaS apps that:

- Are suitable for deployment on modern cloud platforms
- Use declarative formats for setup automation
- Have a clean contract with the underlying operating system
- Minimize divergence between development and production
- And can scale up without significant changes to tooling, architecture, or development practices.

<http://12factor.net> - Created by Adam Wiggins Nov 2011

# THE PORTABLE "12FACTOR" QUIZ APP.

I. Codebase

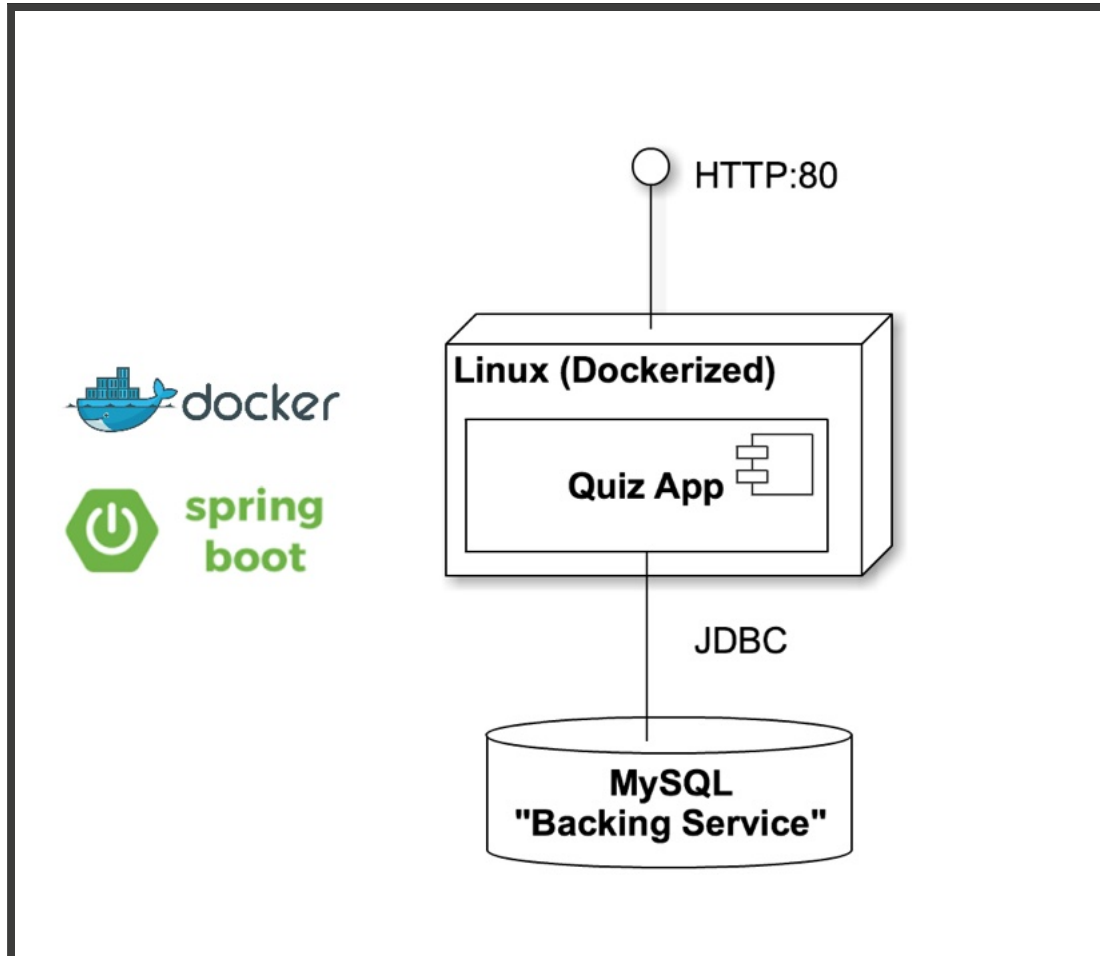
II. Dependencies

III. Config

IV. Backing Services

V. Build,release,run

VI. Processes



VII. Port Binding

VIII. Concurrency

IX. Disposability

X. Dev/prod parity

XI. Logs

XII. Admin processes

Immutable & portable infrastructure with containers

# III. CONFIG

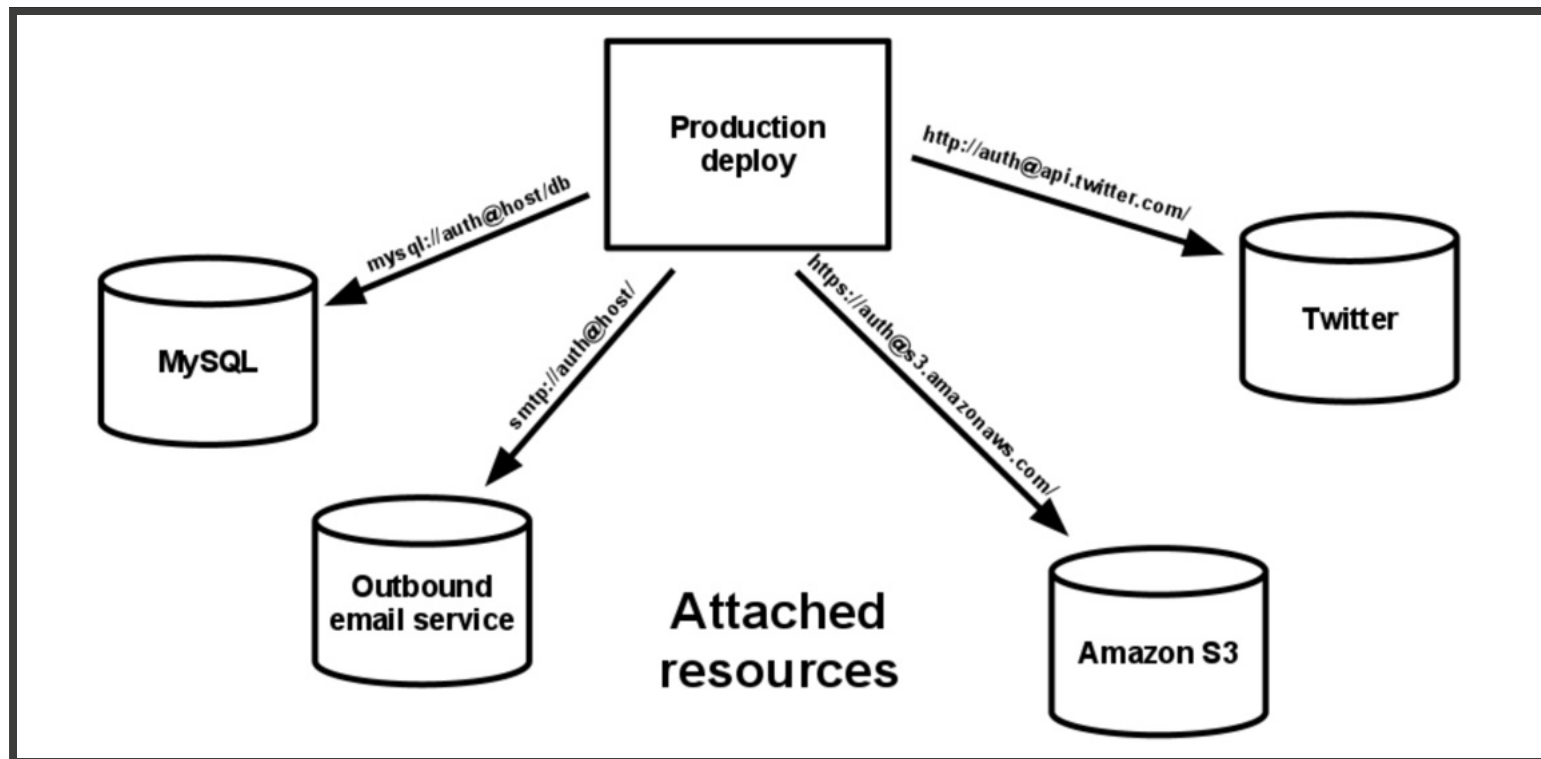
*Store config in the environment*

---

- Strict separation of config from code
- In a twelve-factor app, env vars are granular controls, each fully orthogonal to other env vars. They are never grouped together as “environments”

# IV. BACKING SERVICES

*Treat backing services as attached resources*



The code for a twelve-factor app makes no distinction between local and third party services



# VI. PROCESSES

---

*Execute the app as one or more stateless processes*

- Twelve-factor processes are stateless and share-nothing. Any data that needs to persist must be stored in a stateful backing service, typically a database
- The twelve-factor app never assumes that anything cached in memory or on disk will be available on a future request or job

# IX. DISPOSABILITY

---

*Maximize robustness with fast startup and graceful shutdown*

---

- The twelve-factor app's processes are disposable, meaning they can be started or stopped at a moment's notice
- Processes shut down gracefully when they receive a SIGTERM signal from the process manager
- Processes should also be robust against sudden death

# X. DEV/PROD PARITY

---

*Keep development, staging, and production as similar as possible*

- The twelve-factor app is designed for continuous deployment by keeping the gap between development and production small
- The twelve-factor developer resists the urge to use different backing services between development and production

# XI. LOGS

---

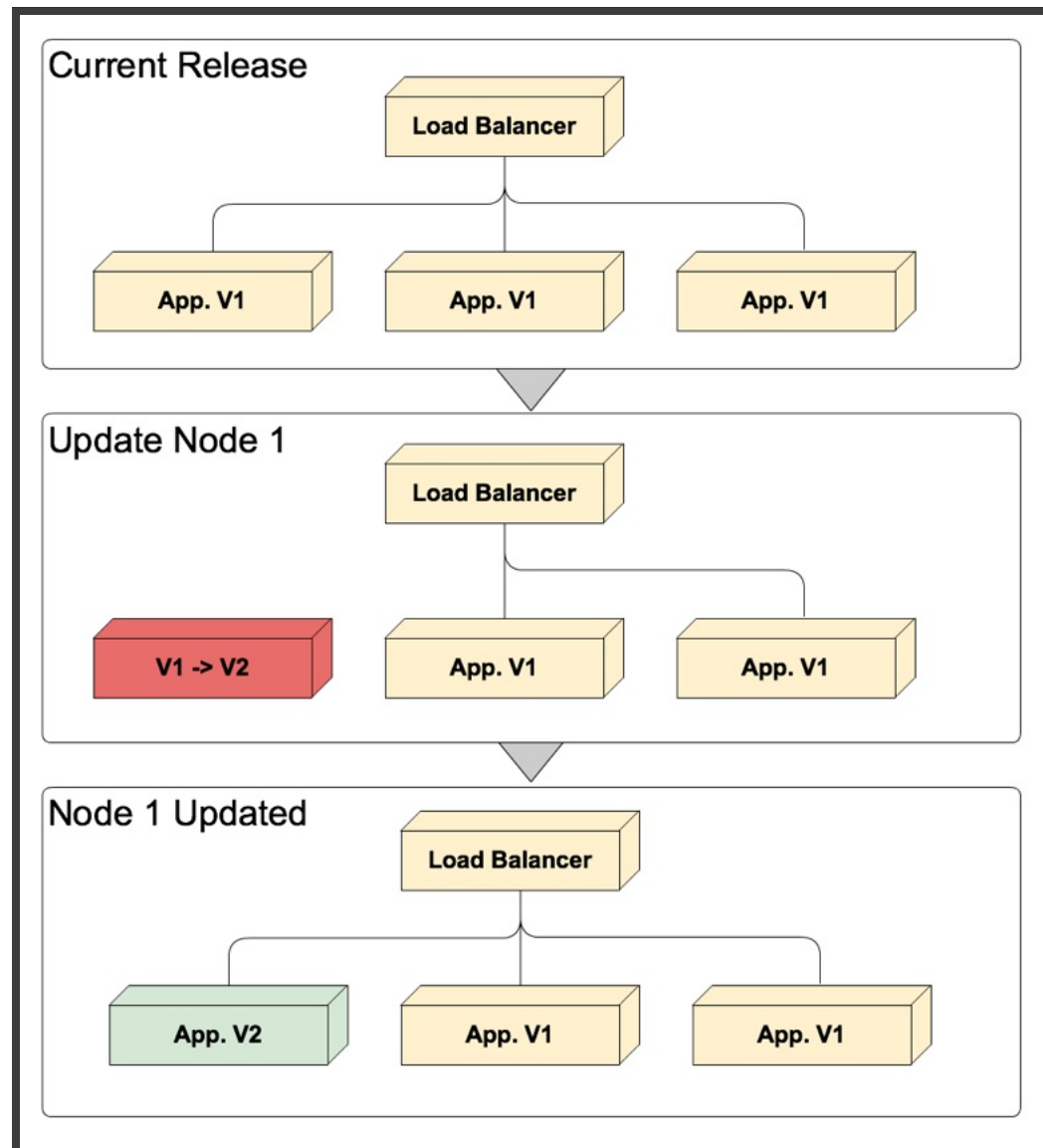
*Treat logs as event streams*

A twelve-factor app never concerns itself with routing or storage of its output stream

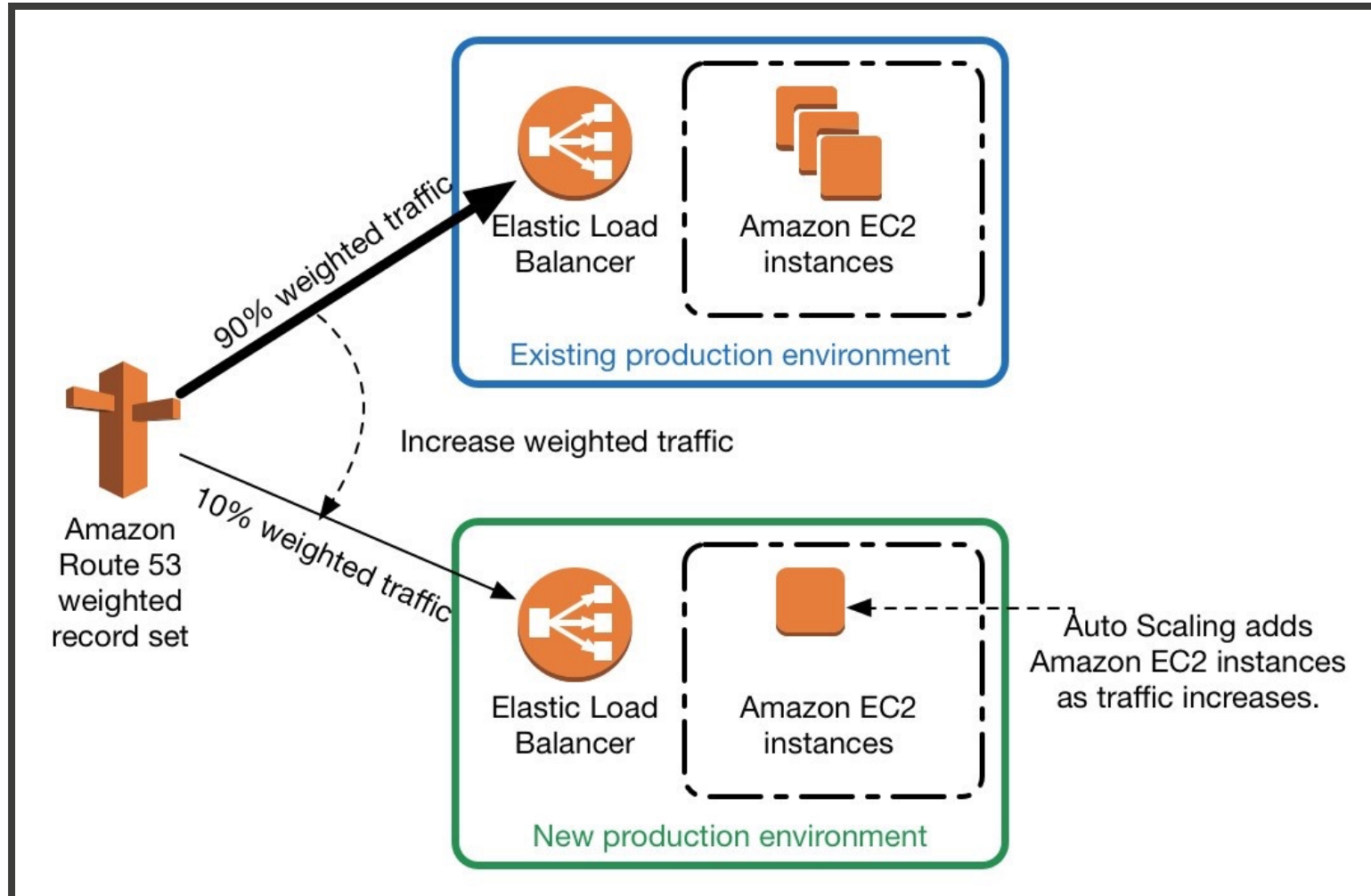
# QUIZ APP. DEMO

# DEPLOY ARCHITECTURE

# ROLLING UPDATES



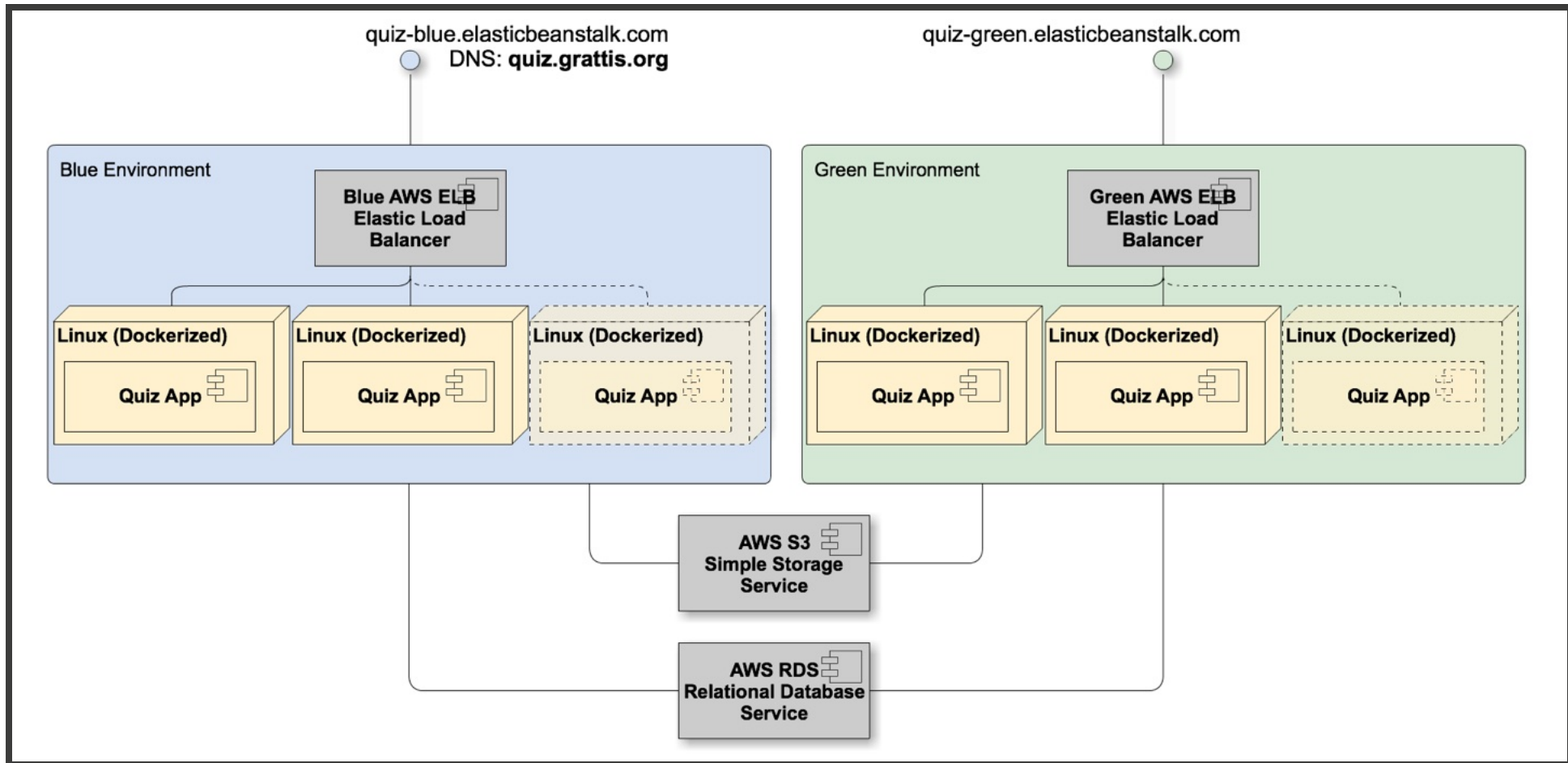
# BLUE/GREEN & CANARY DEPLOYMENT








Amazon Web Services Example



# QUIZ APP. AWS EB DEPLOYMENT



# QUIZ APP. PAAS DEPLOYMENTS

Public PaaS	Docker support	Portability
 Amazon AWS	Elastic Beanstalk, Container Service, Registry	Fully
 Google App Engine	Computing Engine, Container Cluster, Registry	Fully
 Heroku	Proprietary packaging	Limited
 Pivotal Web Services	Cloud Foundry has support, but not yet PWS	-
 Red Hat OpenShift	Container Cluster for Enterprise & Dedicated offerings only	-

# FINALLY

## 12FACTOR

- 12factor methodology is great but there are some additional aspects to consider, as for example:
  - A robust health-check service
  - Resilience to backing service breaches (during startup)
  - Keep track of time zones

## DOCKER

- If you haven't yet adopted Docker it's time to start now!
  - Doesn't fit all kinds of Apps. (requires a highly automated environment and *12factorish* Apps)
  - Private Docker registry is probably required for most Enterprises

# QUIZ - TOP 8 STANDINGS

#	Email	Score	Elapsed

**THAT'S ALL!**