cf push: Push your Scala/Play apps to Cloud Foundry

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Who am I?

• Rags (not to Riches) and work for EMC CODE
• Middleware and Application programmer
• Architect and Evangelist
• Part time teaching at UML and writing at InfoQ
• Philosophy: It’s better to have an unanswered question than a unquestioned answer
Agenda

• Overview and Architecture
• Applications and Services
• Evolving Data Schemas
• Demos
• Resources and Summary
Business Expectations Exceed IT Capabilities

The exponential increase in business expectations is unsustainable for IT.

PaaS (On Premise & Off Premise)

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

You Manage

IaaS
- Applications
- Data
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Business Value, Agility & Cost Savings

Cloud Foundry + OpenStack
Microservices Architectures

- Microservices: a radical departure from traditional monolithic applications
- 12 Factor Linux applications
- In both cases, the enterprise is forced to “think different.”
Application Development - IaaS vs PaaS

- Provision VM
- Install Application Runtime
- Deploy Application
- Configure Load Balancer
- Configure SSL Termination
- Configure Service Connectivity
- Configure Firewall

- cf push
- cf bind-service
- cf scale
## Cloud Foundry

### Enterprise Capabilities At A Glance

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### Running on top of

- VMware
- OpenStack
- Amazon Web Services
- RSA
- VCE
- EMC
- Pivotal

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Removing Developer and Operator Constrains

- **Self-service removal**
- **A/B versioning**
- **Live upgrades**

**BUILD APPLICATION**
- Auto-detect frameworks
- Link to PaaS

**RETIRED APPLICATIONS**

**PUSH FIRST RELEASE**
- Self-service deploy
- Dynamic routing
- CI/CD

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

**MAINTAIN APPLICATION**

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Cloud Foundry Foundation

Gold

IBM
EMC
HP
Rackspace
VMware

Silver

Accenture
Intel
BNY Mellon
Capgemini
CenturyLink
Swisscom

Pivotal
Epic
ActiveState
NTT
Verizon

mongoDB
bluebox
Alpine
CloudCredo
JFrog

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Cloud Foundry Runtime Architecture

Ops Manager UI
Ops Manager Director
Operations Manager

Dynamic Router
Cloud Controller
Health Manager
UAA
Login Server
DEA Pool
Messaging (NATS)
Metrics Collection
App Log Aggregator
Elastic Runtime

HA Proxy LB
Service Broker
Service Nodes
Service

Service Broker
Service Nodes
When you deploy Cloud Foundry the following sequence of steps occur:

1. Target a BOSH director using CLI
2. Upload a Stemcell
3. Get a Release from a repo
4. Create a deployment manifest
5. BOSH Deploy Cloud Foundry:
   • Prepare deployment
   • Compile packages
   • Create and bind VMs
   • Pull in job configurations
   • Create needed job instances – this is where things get pushed live
Behind the Scenes - BOSH

Deployment
- Packages
- Blobs
- Source
- Jobs
- Manifest

IaaS
- Worker VMs
  - Messaging
  - Health Manager
  - Cloud Controller
Target VM

Deploy

BOSH Director
- DB
- Blobs
- Message Bus
- Health Monitor

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Stage an Application

Blobstore ➔ Cloud Controller ➔ DB

DEA ➔ System Buildpacks ➔ Detect Yes ➔ Compile ➔ Upload

Pivotal CF Elastic Runtime
Application Deployment Overview

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

Cloud Foundry Runtime (ERS)

CLI

Cloud Controller

Service Broker

Data Service

DB

Service credentials

create service (HTTP)
bind service (HTTP)

reserve resources
obtain connection data

create service (HTTP)
bind service (HTTP)

creates service (HTTP)
bind service (HTTP)
Managed Services

Service Brokers generate connection details and credentials for managed services.

CC encrypts and stores credentials in CCDB.

Credentials are exposed to bound applications via VCAP_SERVICES environment variable.
VCAP_SERVICES environment variable is visible only to members of the org and space containing the service instance.

```javascript
VCAP_SERVICES=" { 
"p-mysql": [ 
{ 
"name": "music-db", 
"label": "p-mysql", 
"tags": [ "mysql", "relational" ], 
"plan": "100mb-dev", 
"credentials": { 
"hostname": "192.168.1.147", 
"port": 3306, 
"name": "cf_accea021_7f27_48db_9844_d7c151f29195", 
"username": "Tr12ZI4hPu40PJPY", 
"password": "fuTWBqpGeyvv0qge", 
"uri": "mysql://Tr12ZI4hPu40PJPY:fuTWBqpGeyvv0qge@192.168.1.147:3306/ 
  cf_accea021_7f27_48db_9844_d7c151f29195?reconnect=true"
}
}
]
" 
}
" 
}"
```
Evolving Schemas with evolutions
Evolving Data Schemas

• Scripts written in plain old SQL
• Evolutions to default database at conf/evolutions/default(1.sql, 2.sql, ...)

```sql
# --- !Ups

CREATE TABLE User (  
);

# --- !Downs

DROP TABLE User;
```
Resources and Summary
Call for Action

- Sign up for the CF and BOSH mailing lists.
- Install Cloud Foundry on OpenStack (blog out soon)
- Learn how to write 12-factor applications.
- Free workshop and roadshows. CFAD!
- Register for the next Cloud Foundry Summit (May)
- Try out Pivotal Web Services (http://run.pivotal.io)
- Join the Cloud Foundry Community Boston.