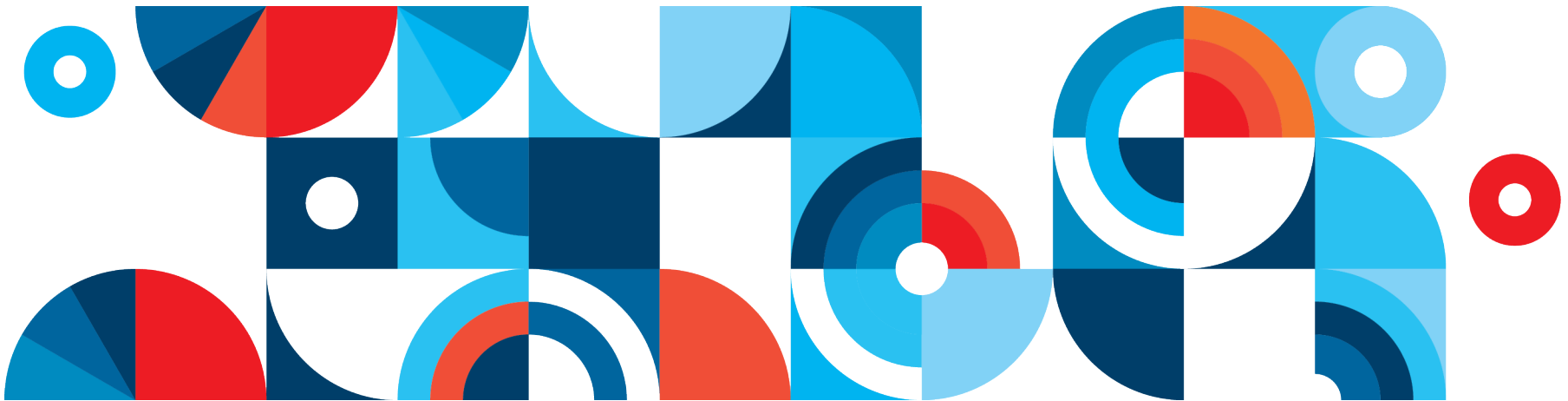


Linux NW Fest, April 2016

# Cloud Foundry Hands-On Labs

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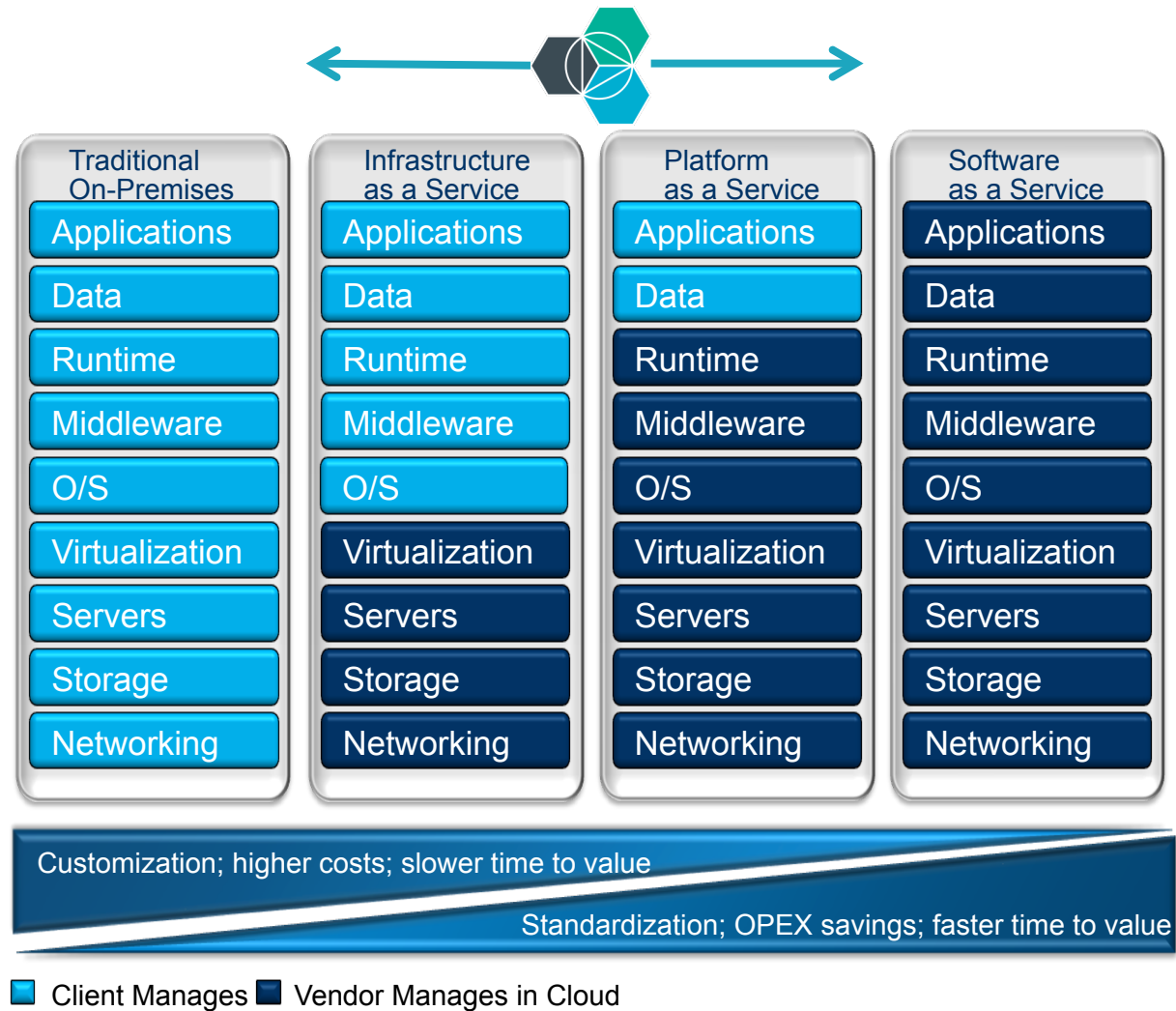


## Agenda

- Intro to Cloud Foundry
- IBM Bluemix and cf CLI
- Hands-On Labs

# Platform as a Service

- Bluemix eliminates / dramatically simplifies various tasks:
- OS patching
- OS security hardening
- Deployment
- Load-balancing
- Scaling
- Health management



# A Platform that handles the Non-Functional Requirements



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



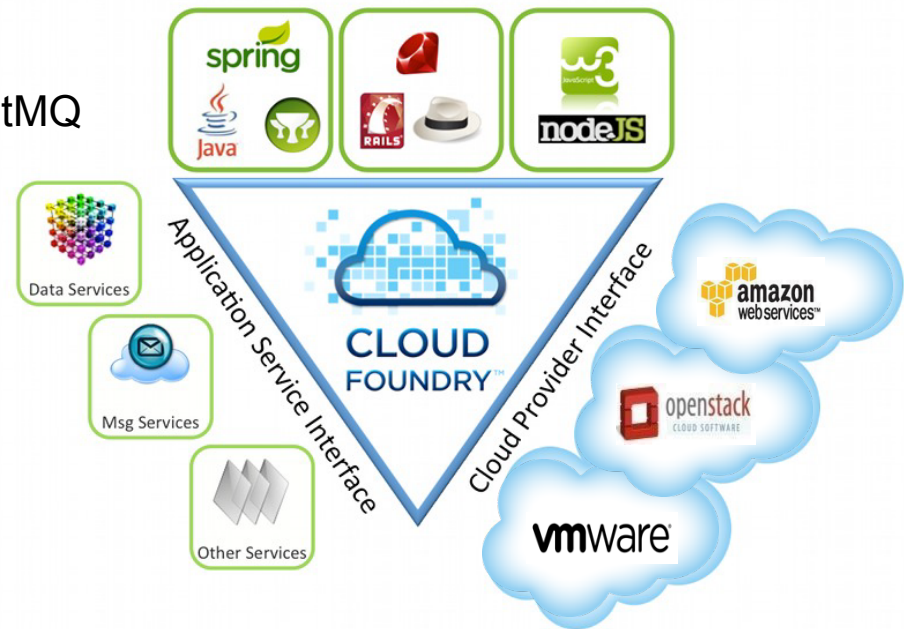
# CLOUD FOUNDRY™

- Dec 2014: Cloud Foundry Foundation Launches
  - Support From Over 40 Companies
  - IBM and HP are Sponsors in addition to other companies
- Open Standards, Open Governance
- PaaS – Platform as a Service
  - Bring your application, run it. No fuss.
- IBM uses Cloud Foundry in Bluemix

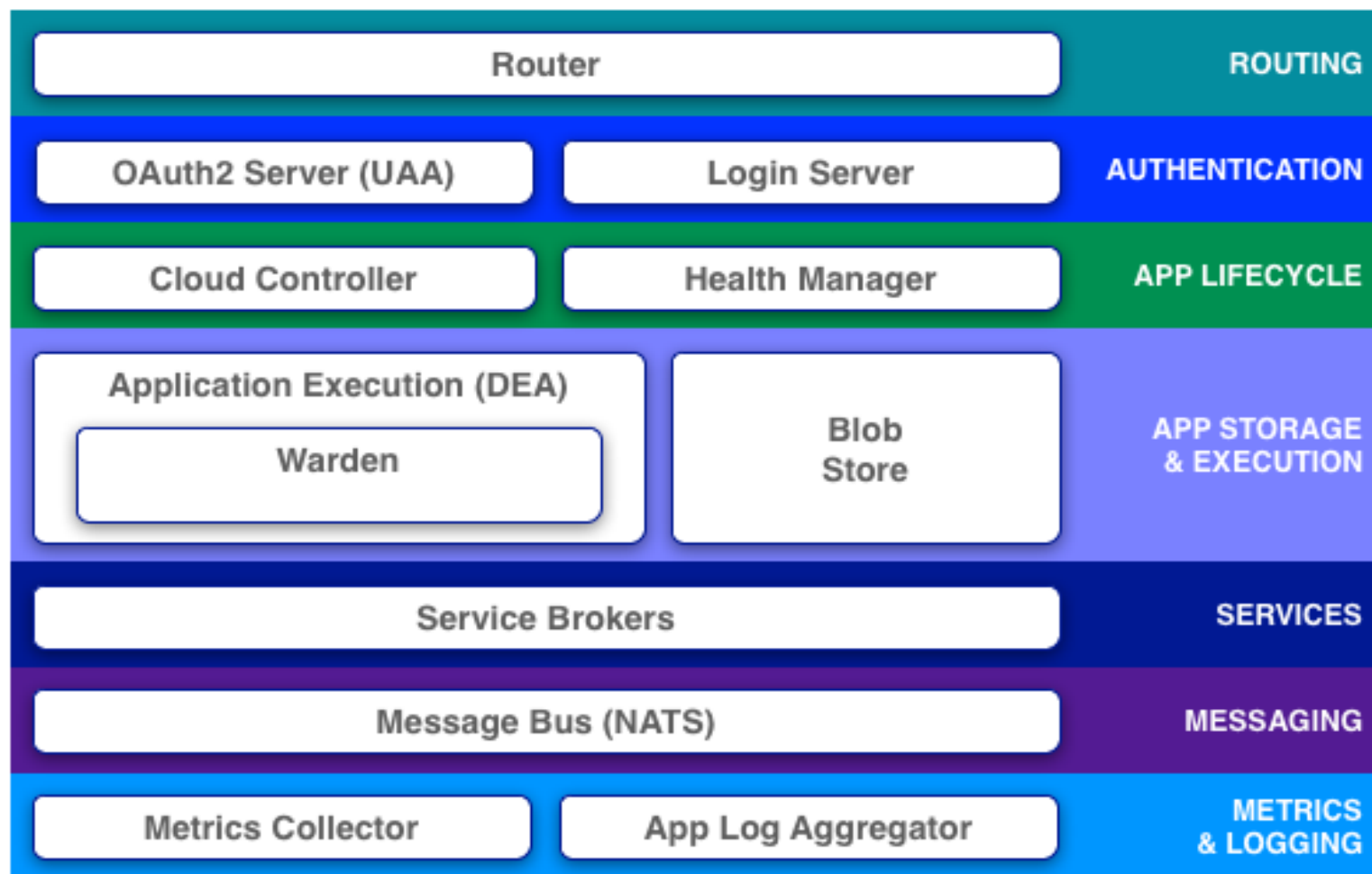


# Languages/Frameworks/Service

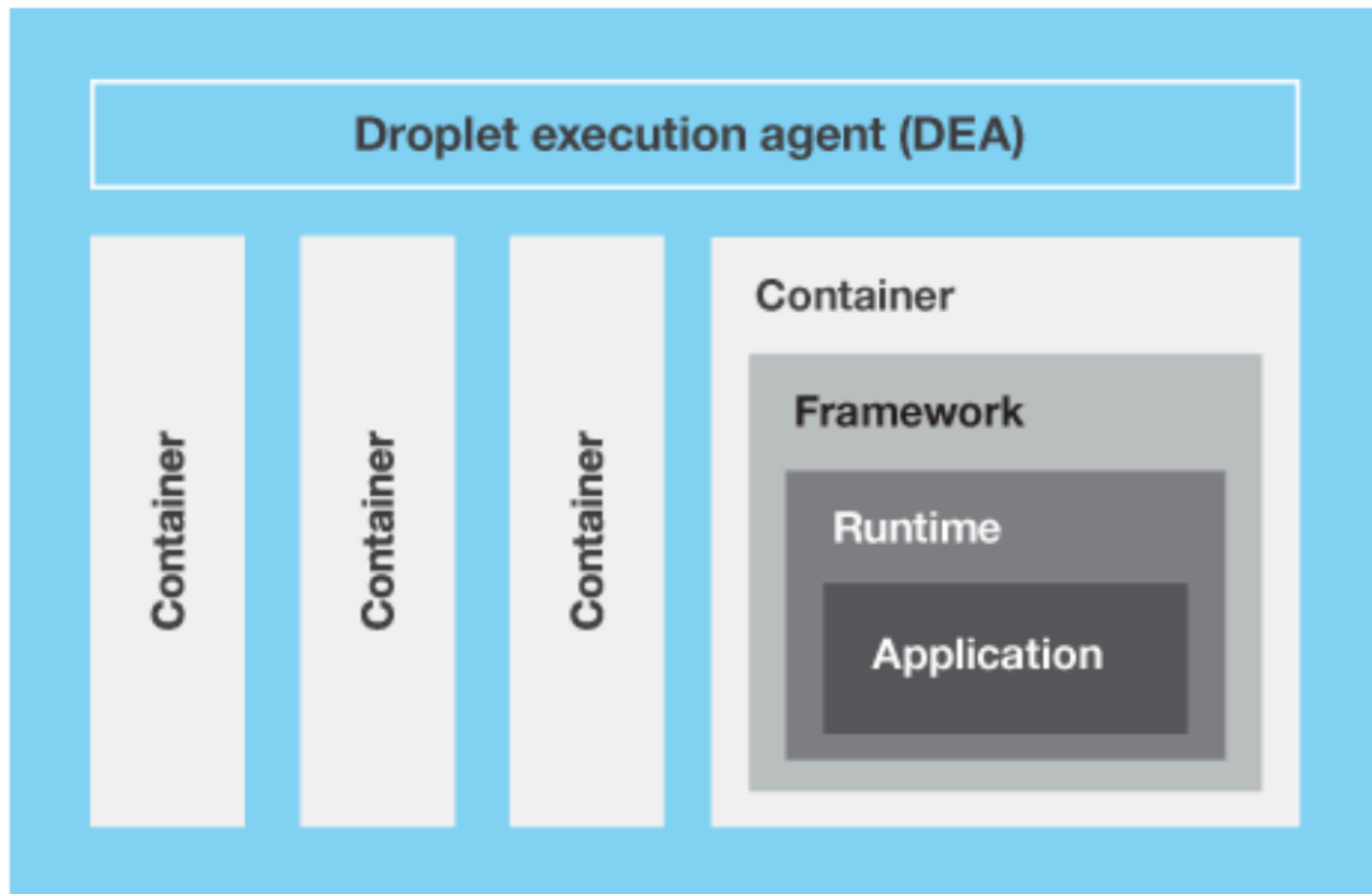
- Multi-Language
  - Ruby, Java, Scala, Node.js, Erlang, Python, PHP..
- Multi-Framework
  - Rails, Sinatra, Spring, Grails, Express, Lift
- Multi-Services
  - MySQL, Postgres, MongoDB, Redis, RabbitMQ
- Multi-Cloud, Multi-IaaS
  - Public Cloud, MicroCloud, Private Cloud



# Cloud Foundry Kernel Internals

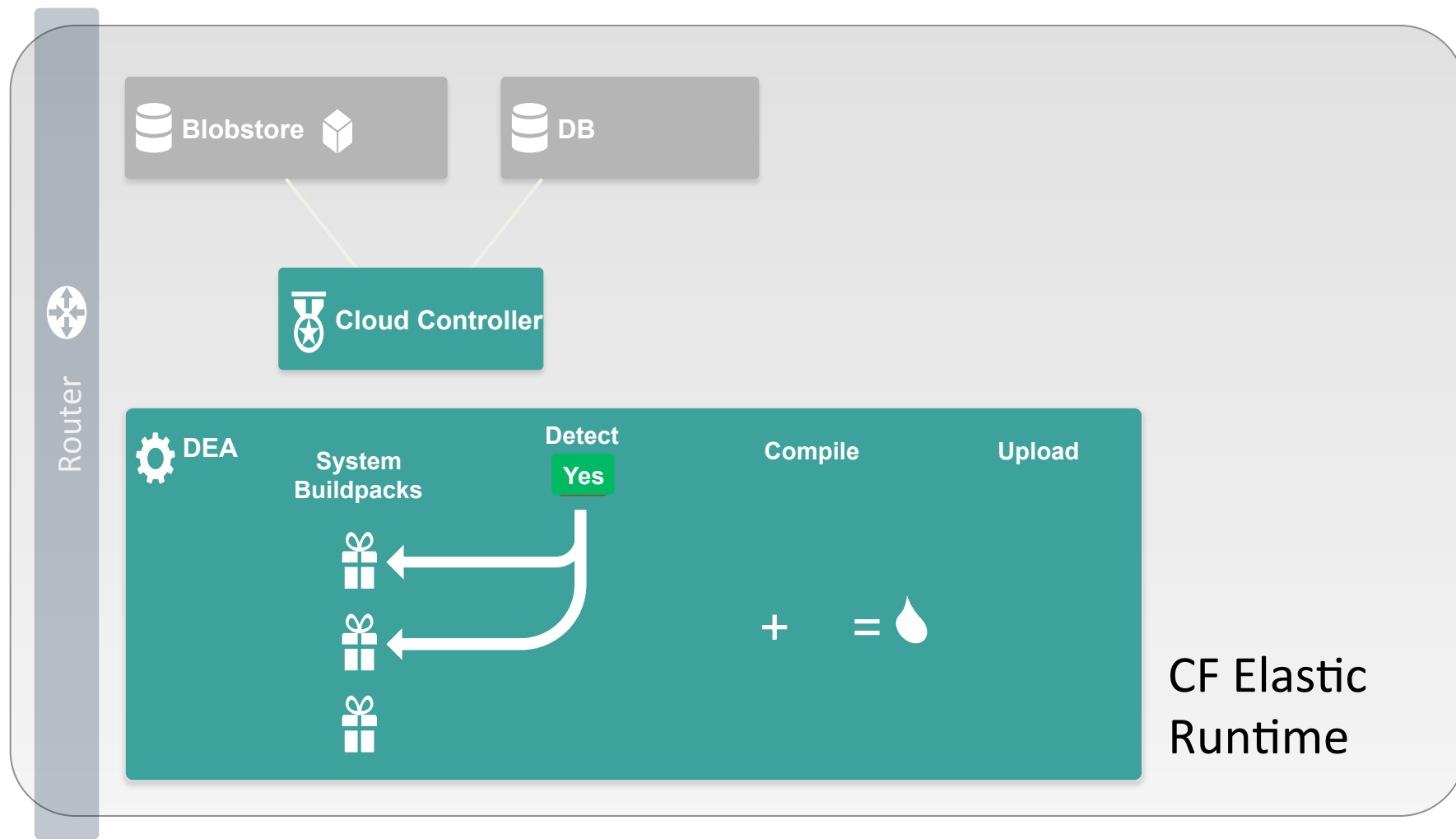


# Container Architecture

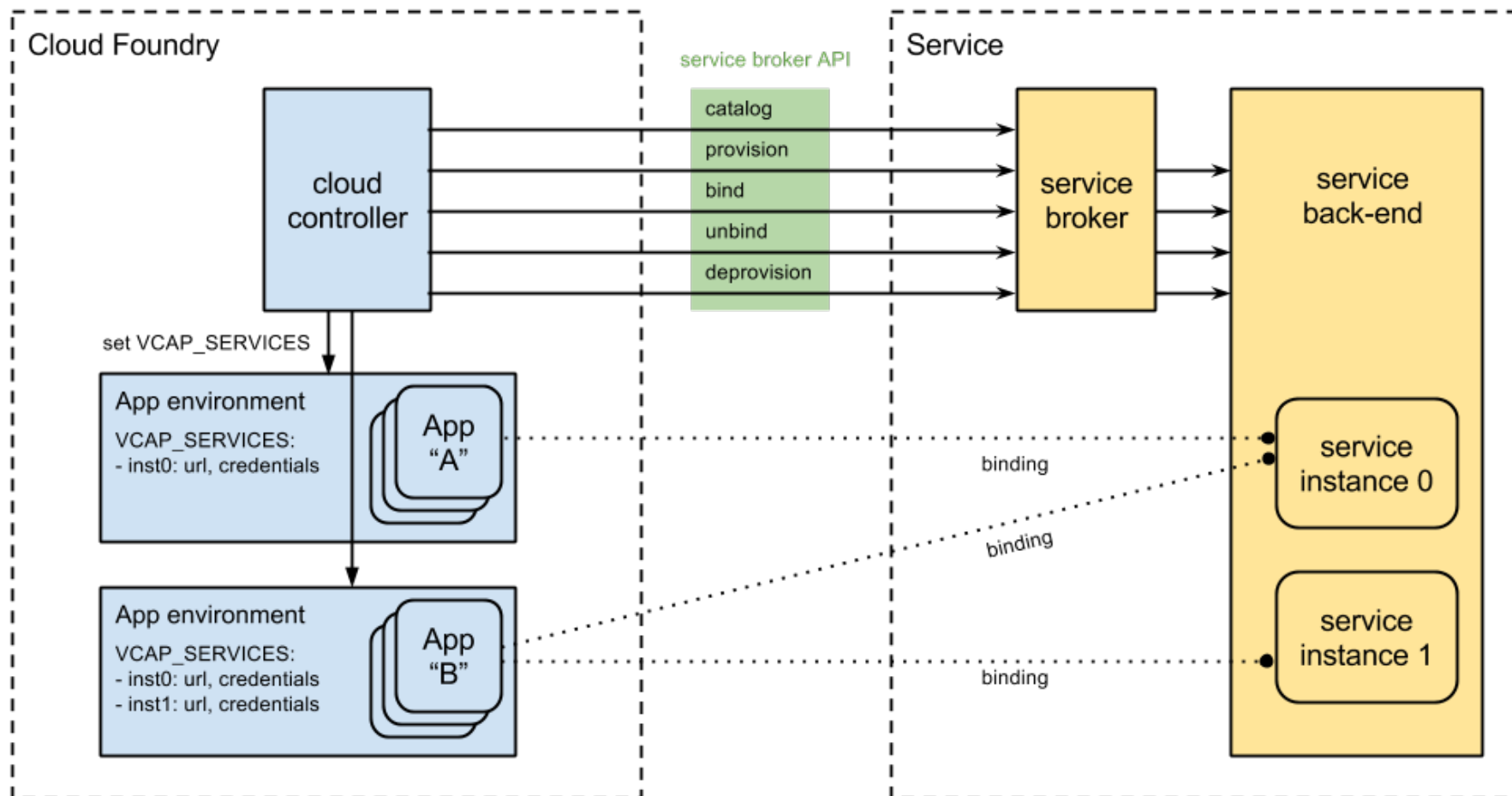




# Application Staging



# Cloud Foundry - Services



## Accessing a service

- When you bind a service to your application Cloud Foundry will add details about the service to an environment variable **VCAP\_SERVICES**.
- **VCAP\_SERVICES** can be inspected in the web UI
- Applications should parse **VCAP\_SERVICES**.

The screenshot shows the Cloud Foundry web UI. On the left sidebar, under the 'Environment Variables' section, the 'Environment Variables' link is highlighted with a blue oval and a callout bubble containing the word 'Click'. The main panel displays the 'Environment Variables' page with two tabs: 'VCAP\_SERVICES' (active) and 'USER-DEFINED'. The 'VCAP\_SERVICES' tab shows a JSON object for 'cloudantNoSQLDB' with details like name, label, plan, and credentials. At the bottom of the main panel, there is a footer that reads 'Hands on Workshop - © Copyright IBM Corporation 2015' and an 'EXPORT' button.

```

{
  "cloudantNoSQLDB": [
    {
      "name": "BI-MyFirstDeploy-BI-cloudantNoSQLDB",
      "label": "cloudantNoSQLDB",
      "plan": "Shared",
      "credentials": {
        "username": "22619f6f-dae8-4791-b7a9-3ef43e8eb788-blumix",
        "password": "a715950865d0f25d3c7cf0ea9156cc395d4ba89bbc0bffa994e4e40791e252a",
        "host": "22619f6f-dae8-4791-b7a9-3ef43e8eb788-blumix.cloudant.com",
        "port": 443,
        "url": "https://22619f6f-dae8-4791-b7a9-3ef43e8eb788-blumix:a715950865d0f25d3c7cf0ea9156cc395d4ba89bbc0bffa994e4e40791e252a@2261"
      }
    }
  ]
}

```

# Parsing VCAP\_SERVICES

- Node

```
if (process.env.VCAP_SERVICES) {  
  var env = JSON.parse(process.env.VCAP_SERVICES);  
  var credentials = env['mysql-5.5'][0].credentials;  
  ...  
}
```

- Ruby

```
mysql_dbs = JSON.parse(ENV['VCAP_SERVICES'])["mysql-5.5"]  
credentials = mysql_dbs.first["credentials"]
```

- Java

```
String vcap_services = System.getenv("VCAP_SERVICES");  
if (vcap_services != null && vcap_services.length() > 0) {  
  JsonRootNode root = new JdomParser().parse(vcap_services);  
  JsonNode mysqlNode = root.getNode("mysql-5.5");  
  JsonNode credentials = mysqlNode.getNode(0).getNode("credentials");  
  ...  
}
```

- Note Java buildpack parses VCAP\_SERVICES and can auto configure bound services – see [Bluemix Liberty for Java documentation](#)

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IBM Bluemix

DASHBOARD
SOLUTIONS
CATALOG
PRICING
DOCS
COMMUNITY
205

ORG: raghsrin@us.ibm.com

+ Create a Space

dev
 

- CF APPS (9)
- SERVICES (7)
- CONTAINERS (3)
- VIRTUAL MACHINES (1)

Cloud Foundry Apps
 3.961 GB/32 GB Used

CREATE APP

Containers
 1.500 GB/16 GB | 4/4 Public IPs

START CONTAINERS

Virtual Machines
 3 GB/12 GB | 2/11 Public IPs

RUN VIRTUAL MACHINES

Data & Analytics

WORK WITH DATA

Services & APIs

USE SERVICES OR APIS

### Applications

App Name	Runtime	Health	Actions
bl-todo <a href="http://bl-todo.mybluemix.net">http://bl-todo.mybluemix.net</a>	Liberty for Java™	Unknown	
bmvirtualV2-ragsibm-1036 <a href="http://bmvirtualV2-ragsibm-1036.myb...">http://bmvirtualV2-ragsibm-1036.myb...</a>	SDK for Node.js™	Unknown	
hello-cloud <a href="http://hello-cloud.mybluemix.net">http://hello-cloud.mybluemix.net</a>	Liberty for Java™	Unknown	
pcfdemo <a href="http://pcfdemo-chariotlike-infinite-b...">http://pcfdemo-chariotlike-infinite-b...</a>	Liberty for Java™	Unknown	

# Command Line Interface

- Cloud Foundry command line interface (CLI) – cf
- cf help – provides help page showing all the commands
- cf help <command> - provides help for specific command

<b>cf l</b> login	<b>cf ds</b> delete service
<b>cf t</b> target space or organization	<b>cf bs</b> bind service to application
<b>cf a</b> list apps in current space	<b>cf st</b> start app
<b>cf app</b> display status for specific app in current space	<b>cf sp</b> stop app
<b>cf p</b> push (deploy or update) app	<b>cf d</b> delete app
<b>cf s</b> show service info	<b>cf scale</b> scale app
<b>cf cs</b> create service	<b>cf logs</b> tail or show logs for app

# Manifest file

- Allows you to specify the parameters for an application deployment
- manifest.yml file is used at deploy time if found in directory application is being pushed from

```
---
applications:
- name: bluemix-todo-node
  host: bluemix-todo-node-${random-word}
  command: node app.js
  memory: 128M
  services:
  - todo-db
```

```
---
applications:
- name: Myphpmyadmin
  memory: 128M
  instances: 1
  host: Myphpmyadmin
  path: .
  buildpack: https://github.com/dmikusa-pivotal/cf-php-build-pack.git
  services:
  - mysql_BlueMixLab
```

<http://docs.cloudfoundry.org/devguide/deploy-apps/manifest.html>



## Prerequisites

Registered for a Bluemix account that is  
\*\*still current\*\*

Installed the Cloud Foundry CLI from  
<https://github.com/cloudfoundry/cli>

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## Free trial accounts



<https://ace.ng.bluemix.net/>



<https://run.pivotal.io/>



<http://www.hpcloud.com/products-services/application-paas>

## End of 30 day trial

- Once your 30 day trial ends you will be asked to enter a credit card to continue using Bluemix.
- You are still able to use Bluemix for free after you have entered your credit card details as there is a '[freemium](#)' level of service available:
  - 375 GB-hours are free every month
  - Services have a free plan
  - Use the [Pricing Sheet](#) and price calculator to verify what you can run for free each month
  - Use your account summary to check on your monthly usage
  - Set notifications to advise when cost thresholds are being reached

$$\text{GB-hours} = \text{Total GB/App} \times \text{Number of App Instances} \times \text{Total Hours running}$$


# Bluemix Workloads

Build your apps, your way.

Use a combination of the most prominent open-source compute technologies to power your apps. Then, let Bluemix handle the rest.

**Open Whisk**  
Event-driven apps, deployed in a serverless environment.

**Instant Runtimes**  
App-centric runtime environments based on Cloud Foundry.




[Check out runtimes on Bluemix](#)

**IBM Containers**  
Portable and consistent delivery of your app without having to manage an OS.



[Check out containers on Bluemix](#)

**Virtual Machines**  
Get the most flexibility and control over your environment with VMs.



[Check out VMs on Bluemix](#)



## Summary

- Cloud Native Architectures – a new paradigm
  - Scale and Speed is not just for Netflix/Twitter/Baidu/etc.
  - Microservices not Monoliths
  - 12-factor app. and DevOps
  - Polyglot persistence/Multiple Data services
  - Containers
- Choose a Platform that enables microservices, containers, different services and enables DevOps

## Call For Action!

- Trial Bluemix accounts at <https://console.ng.bluemix.net/>
- Cloud Native Apps. With Spring (5-part) at <http://ryanjbaxter.com/2015/09/14/building-cloud-native-apps-with-spring-part-1/>
- Sign up for the CF [mailing lists](#).
- Learn how to write [12-factor](#) applications.
- Self-paced HOL at <https://github.com/ragsns/javaone-cloudfoundry-hol>
- CFAD!

## Hands-On Labs

<http://ibm.biz/javacfhol>



Thank you!

Questions?

