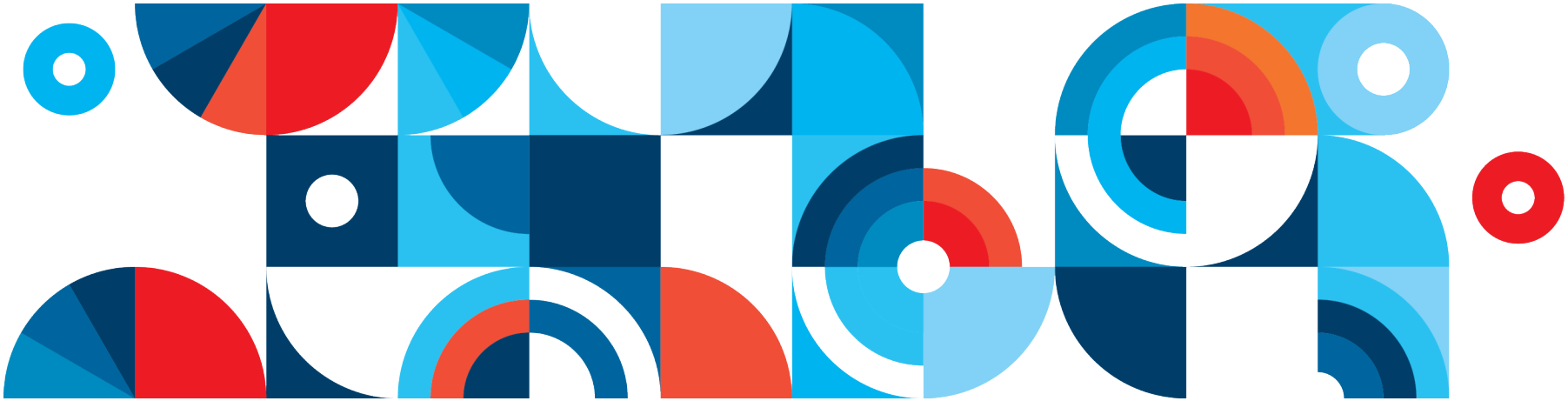
IBM

Linux NW Fest, April 2016

Cloud Foundry Hands-On Labs

Raghavan “Rags” N. Srinivas raghsrin@us.ibm.com or rags@acm.org



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Agenda

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

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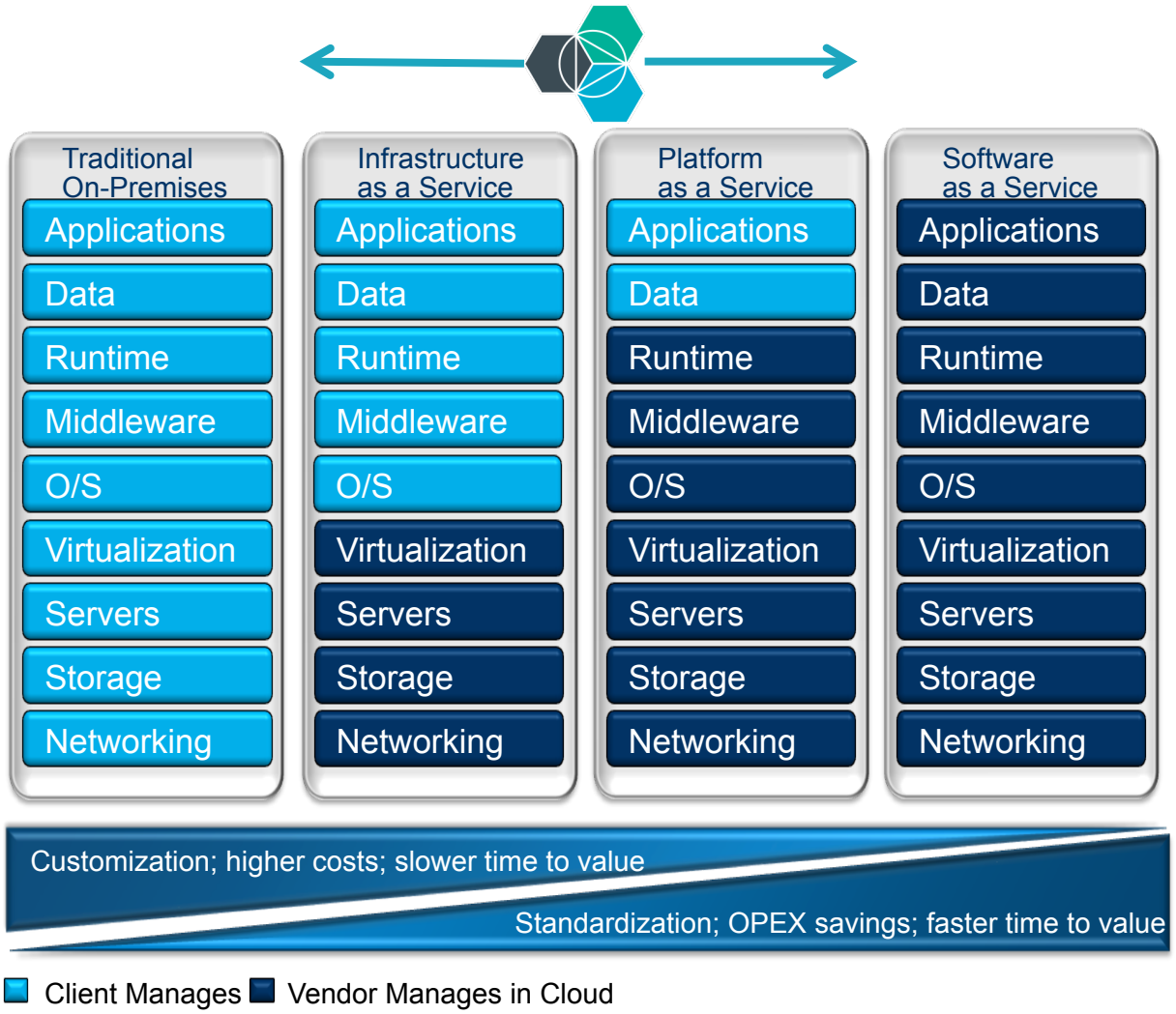
Platform as a Service

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



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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

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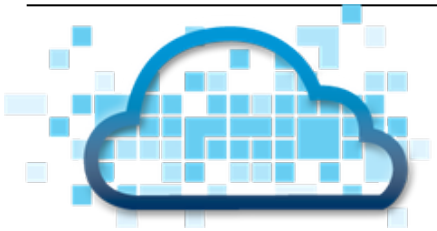

CLOUD FOUNDRY™

- 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

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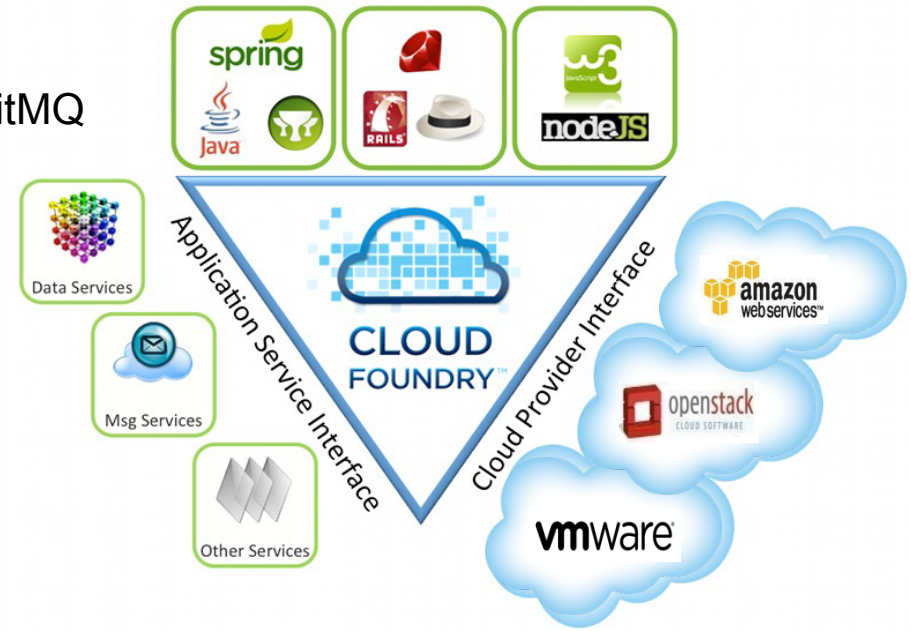
Languages/Frameworks/Service

- 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



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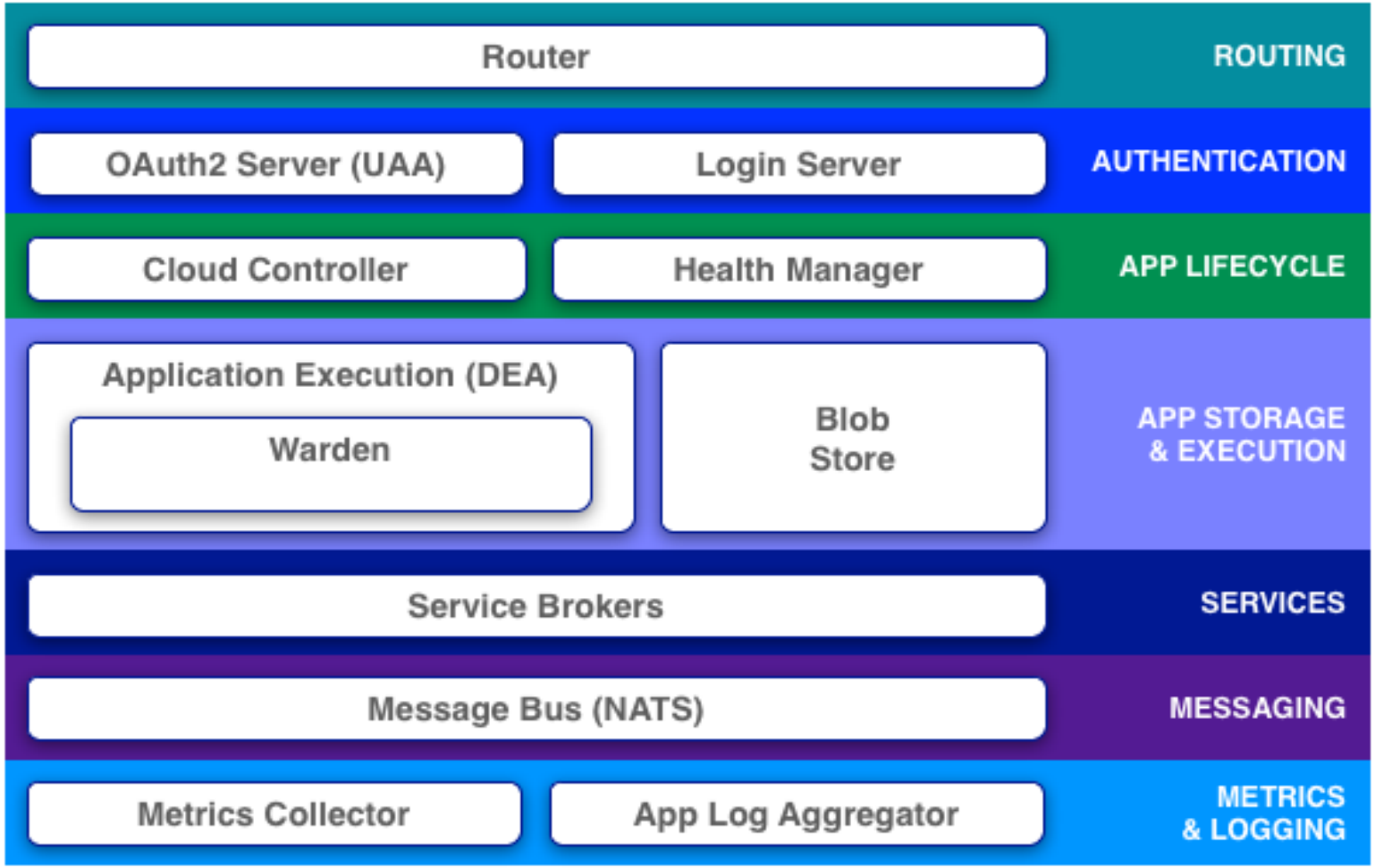
Cloud Foundry Kernel Internals



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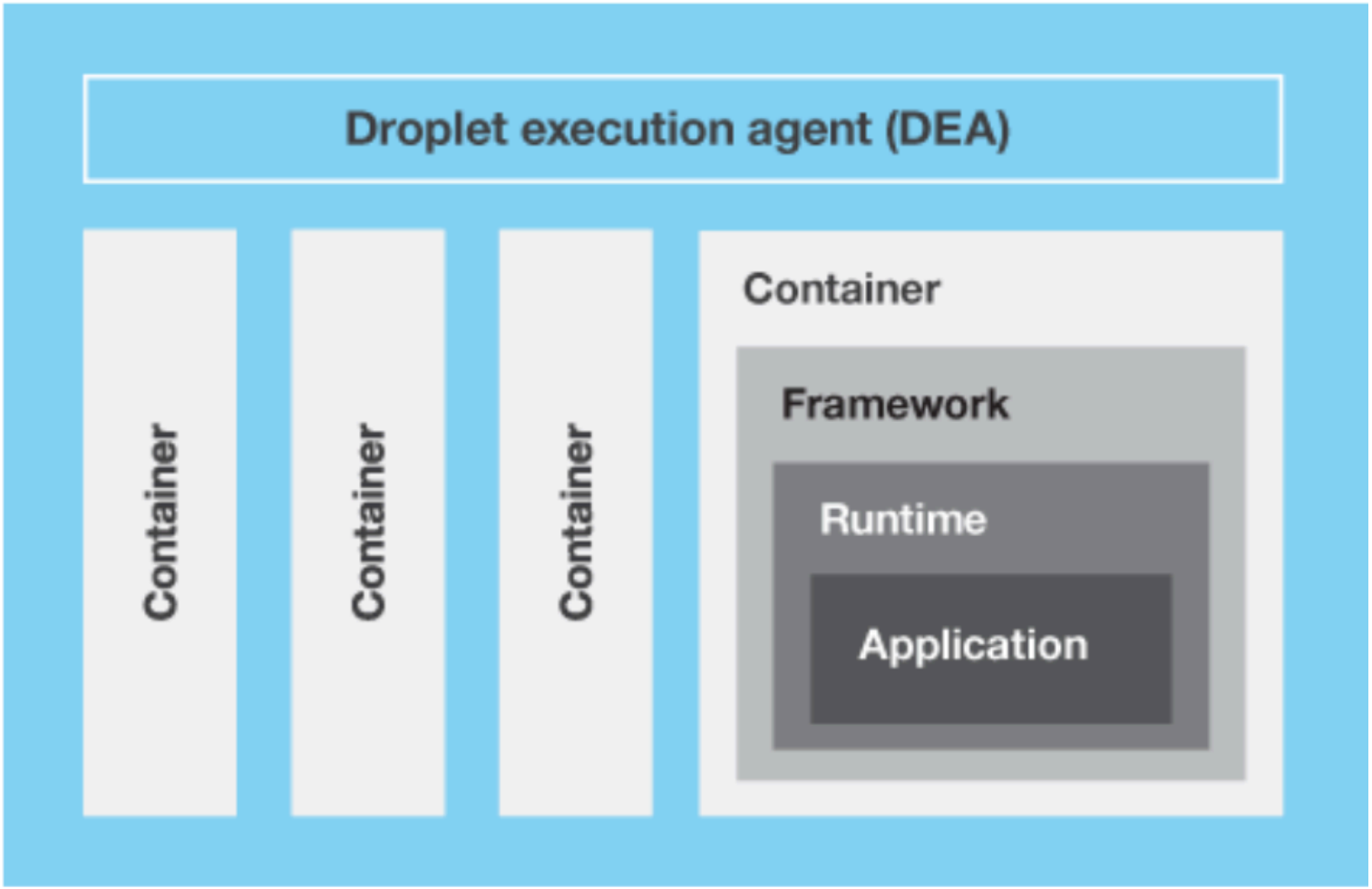
Container Architecture



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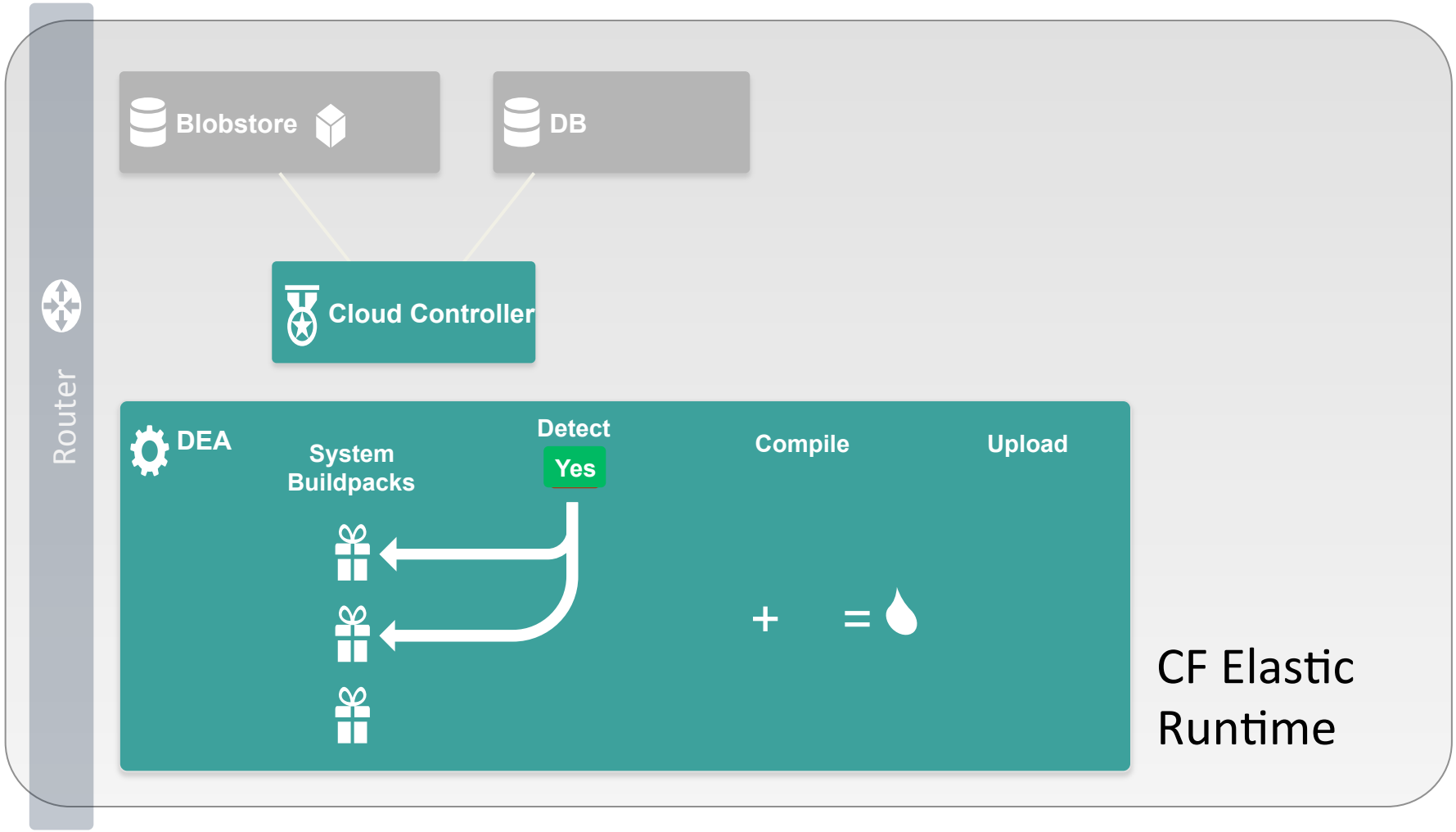
Application Staging



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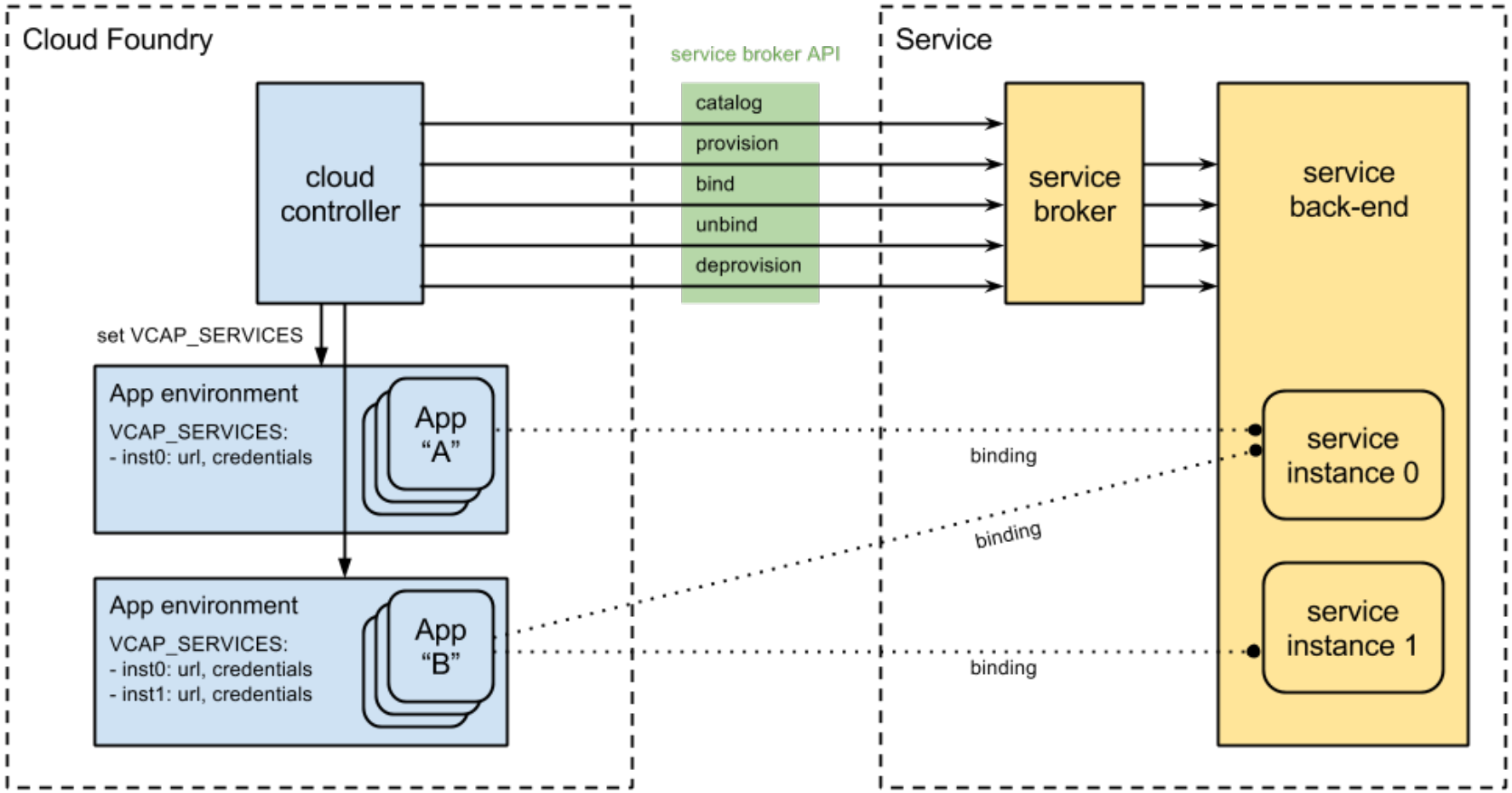
Cloud Foundry - Services



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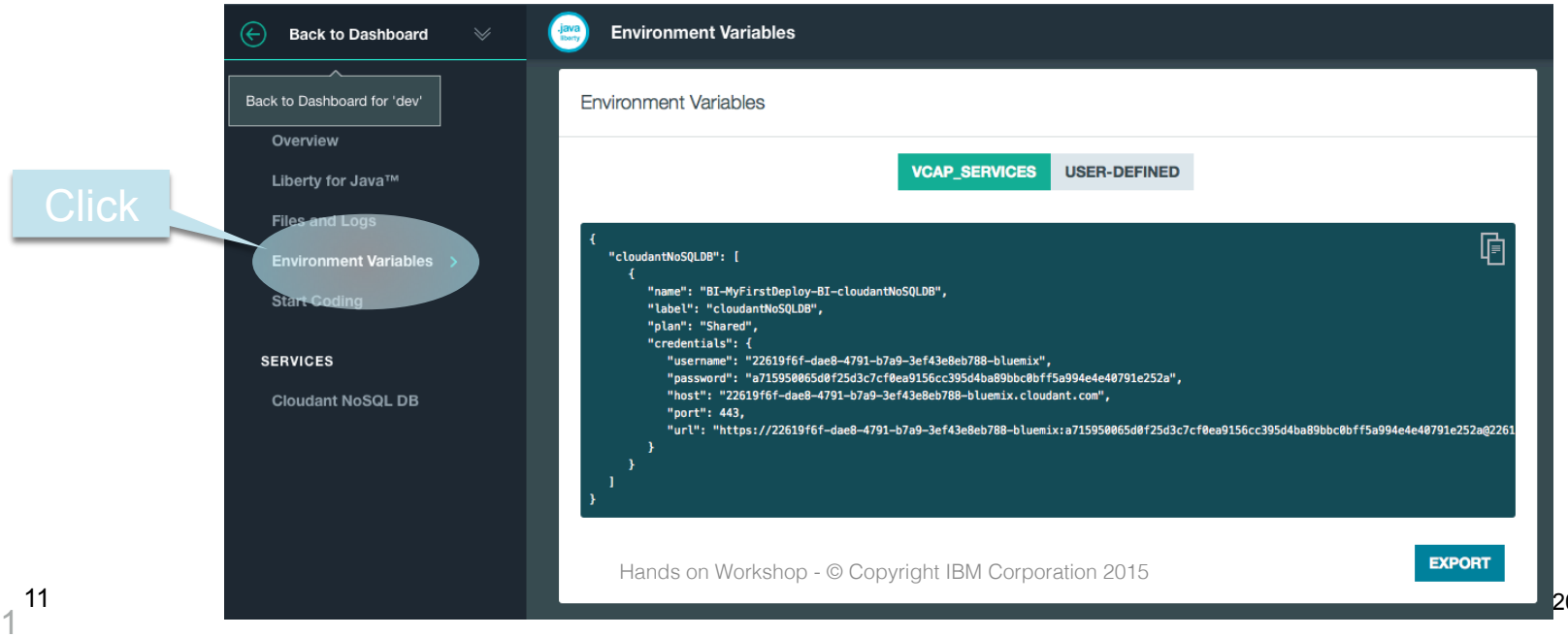
Accessing a service

- 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.



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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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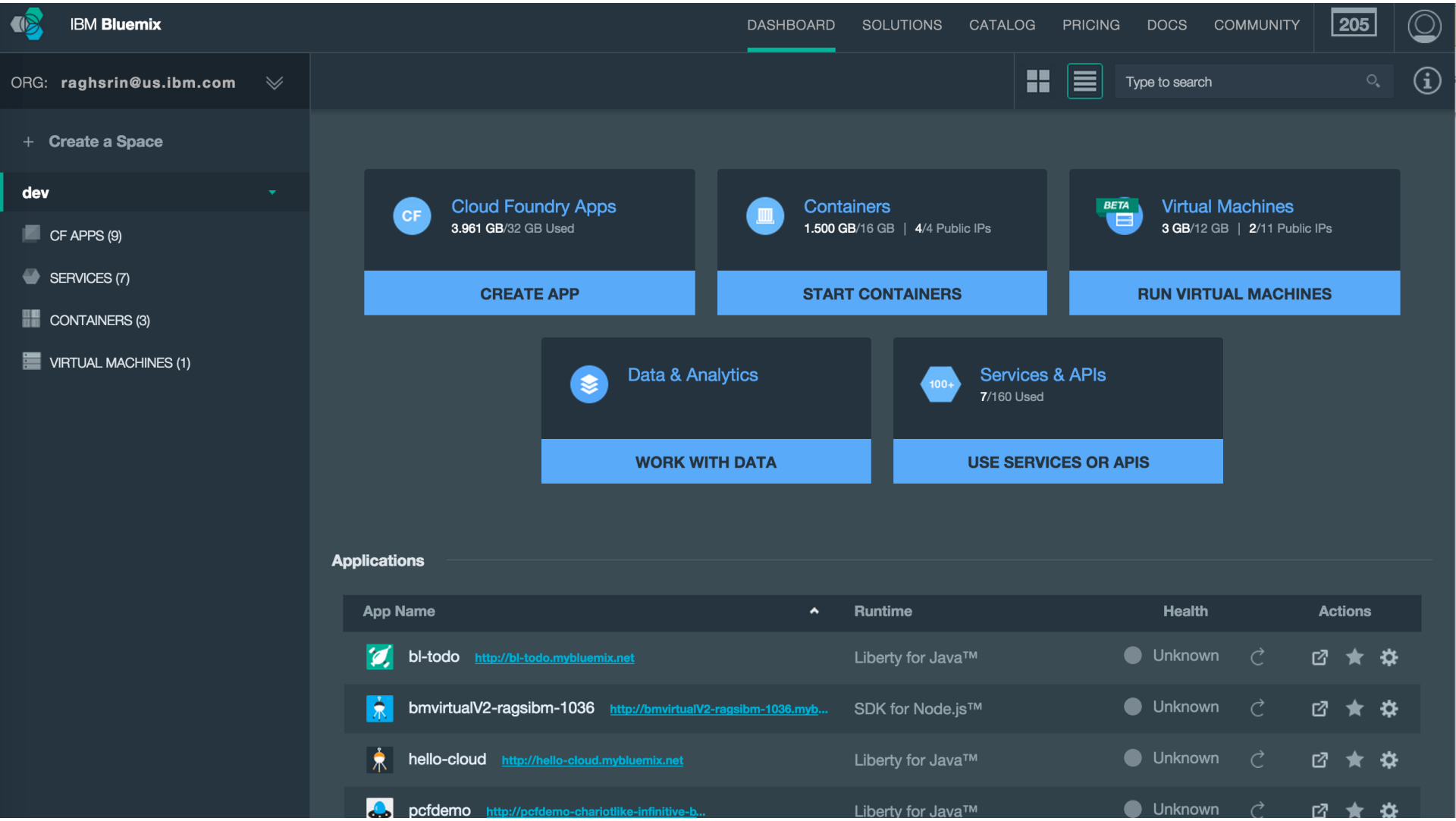

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Command Line Interface

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

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

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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

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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

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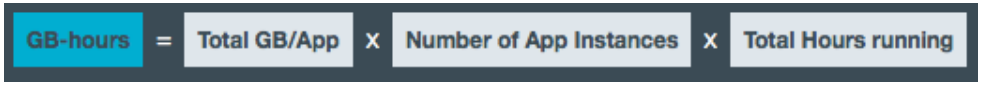
End of 30 day trial

- 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



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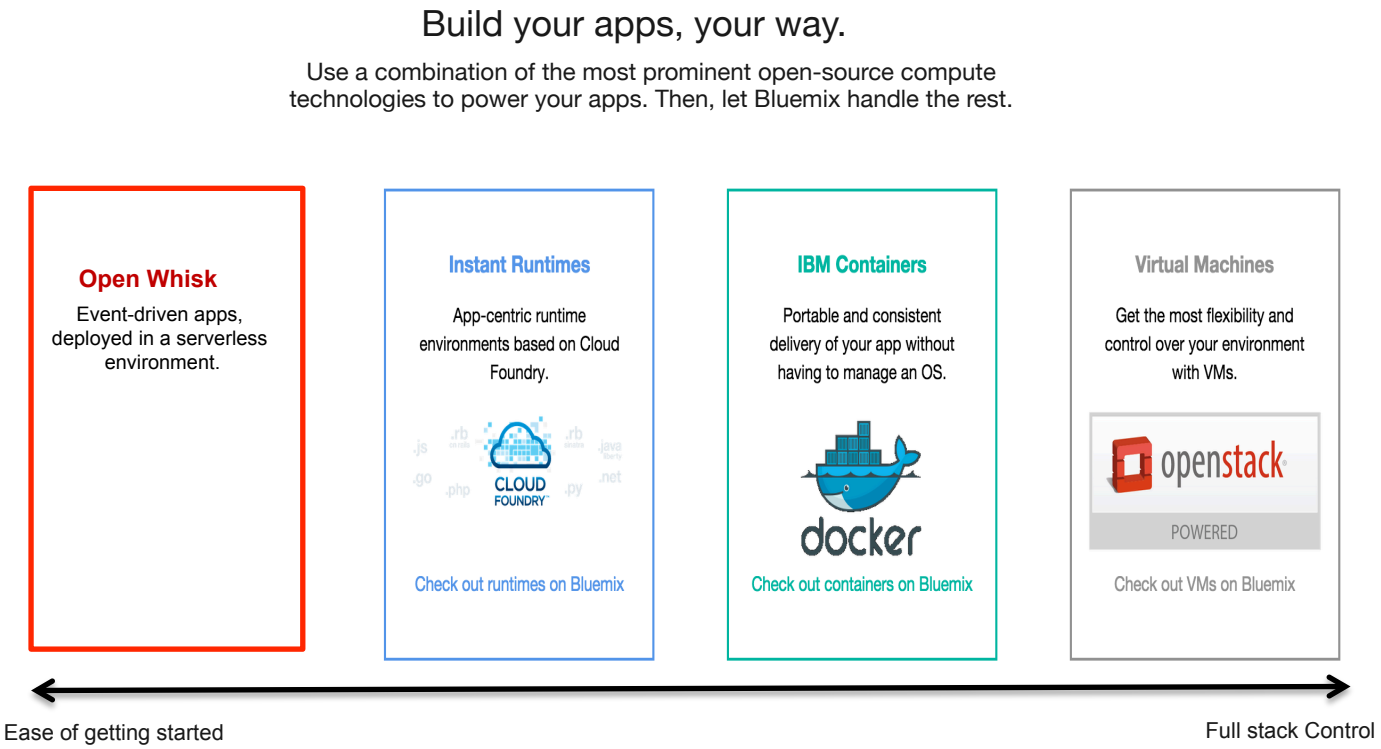
Bluemix Workloads



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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

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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!

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Hands-On Labs

http://ibm.biz/javacfhol

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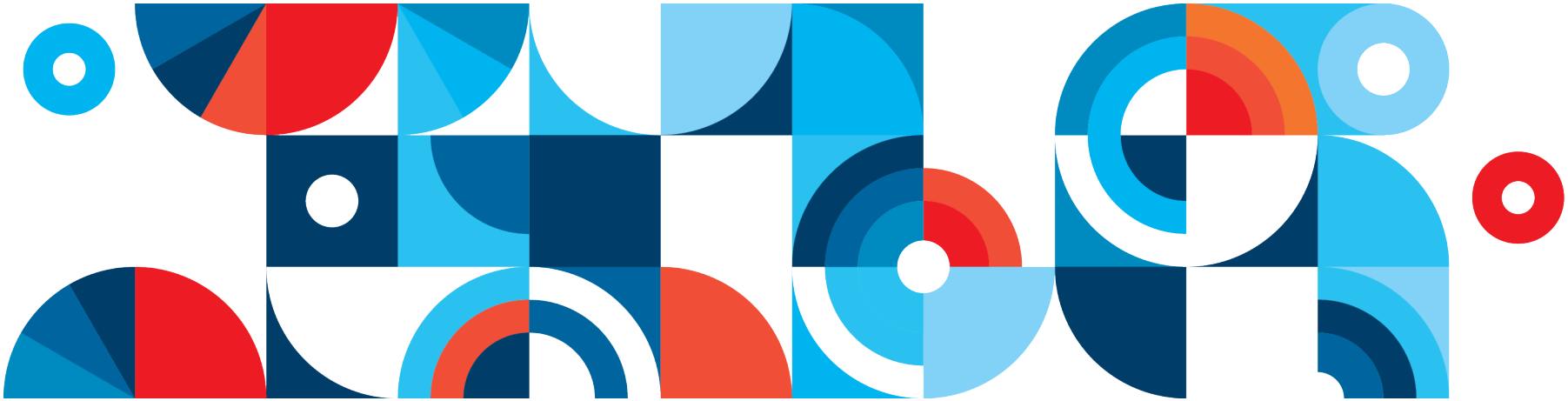
Thank you!

Questions?



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