# Cloud Foundation Services (CFS) – Active Deploy

**Presented by:**

IBM

IBM Cloud

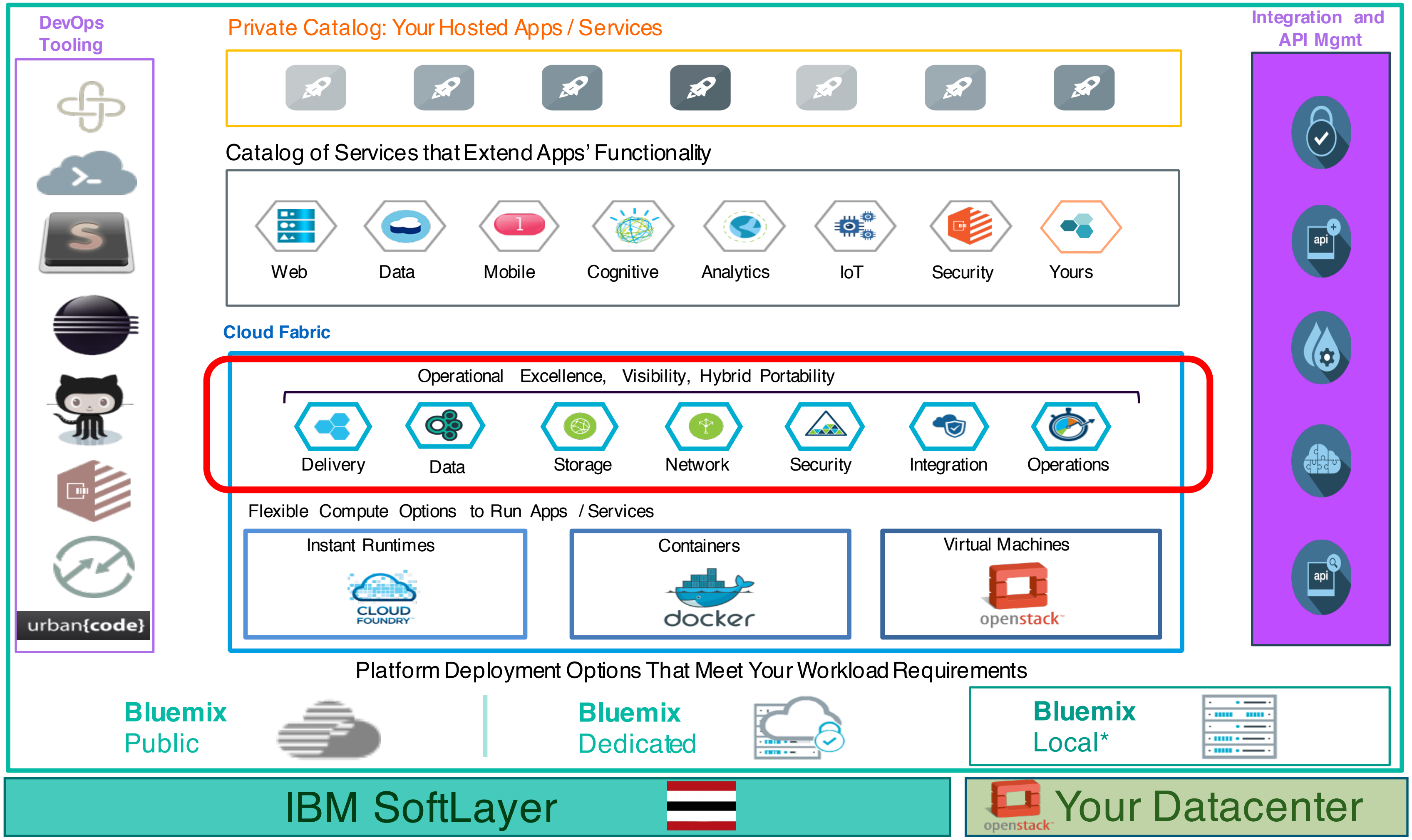
# What is Cloud Foundation Services (CFS)?

# Cloud Foundation Services

Cloud Foundation Services is an IBM Cloud project to build

- a common, pre-integrated set of building blocks
- based on best practices and techniques
- to help DevOps professionals build apps and services
- which can run anywhere

# IBM Cloud Platform – Where Cloud Foundation Services Fit



DevOps Tooling

urban{code}

Private Catalog: Your Hosted Apps / Services

Catalog of Services that Extend Apps' Functionality

Web Data Mobile Cognitive Analytics IoT Security Yours

Cloud Fabric

Operational Excellence, Visibility, Hybrid Portability

Delivery Data Storage Network Security Integration Operations

Flexible Compute Options to Run Apps / Services

Instant Runtimes — CLOUD FOUNDRY

Containers — docker

Virtual Machines — openstack

Integration and API Mgmt

Platform Deployment Options That Meet Your Workload Requirements

Bluemix Public

Bluemix Dedicated

Bluemix Local*

IBM SoftLayer

Your Datacenter — openstack

# Cloud Foundation Services – Overview

**Compute** – *Rich run-times to power your Cloud*

**Storage Services** – *Scalable cloud storage for all needs*

**Network** – *Build agile, intelligent and secure network connections to help support your cloud, analytics, mobility and social business initiatives*

**Security Services** – *Protect your apps and data from security threats and meet compliance requirements*

**Dev Delivery Services** – *Deploy and Manage code throughout the lifecycle.*

**Ops Delivery Services** – *Help Dev & Ops staff keep workloads running*

**Integration Services** – *Easily connect all the parts*

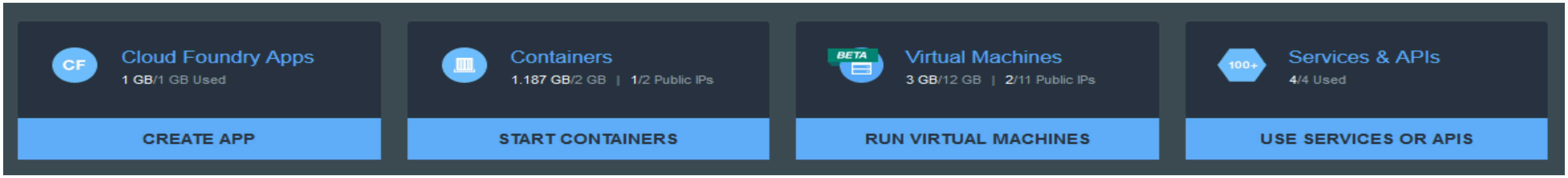
**Domain Services** – *Advanced services adding capabilities for data (e.g. databases), Cognitive (e.g. Speech to text), IoT, and Video*

| | | | | | | |
|---|---|---|---|---|---|---|
| **Compute Services** | **Vm**<br>Virtual Machines | **C**<br>Containers | **Asg**<br>Autoscaler groups | **Lb**<br>Load Balancer | | |
| **Storage Services** | **Ob**<br>Object Store | **Eb**<br>Block Store | **Fs**<br>File Storage | **Sg**<br>Storage Gateway | **Ar**<br>Archive | **B**<br>Backup |
| **Network Services** | **N**<br>SDN | **Dn**<br>DNS | **F**<br>Firewall | **V**<br>VPN | **Cn**<br>CDN | |
| **Security Services** | **IAM**<br>Identity and Access Mgmt | **Ky**<br>Key Mgmt (w/ HSM and Encryptiion) | **At**<br>IBM Cloud Access Trail | | | |
| **Dev Delivery Services** | **Pt**<br>Patterns | **Ca**<br>SW Config | **Ad**<br>Active Deploy | **Ft**<br>Feature Toggles | **Im**<br>Image Builder | **Sb***<br>CF Service Broker |
| **Ops Delivery Services** | **L**<br>Logging | **M**<br>Monitoring & Analytics | **Sd**<br>Svc Discovery | **Eg**<br>Event Generation | **Al**<br>Alerting | **Mk**<br>Controlled Failure Testing |
| **Integration Services** | **Ig**<br>Integration Gateway | **Msg**<br>Message Hub | **Sd**<br>Service Discovery | | | |
| **Domain Services** | **Data**<br>Services | **Cognitive**<br>Services | **IoT**<br>Services | **Video**<br>Services | | |

# Cloud Foundation Services – Most Used/Common Services in any Cloud App/Service

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Compute Services** | Vm<br>Virtual Machines | C<br>Containers | As<br>Autoscaler | Lb<br>Load Balancer | | | |
| **Storage Services** | Ob<br>Object Store | Eb<br>Block Store | Fs<br>File Storage | Sg<br>Storage Gateway | Ar<br>Archive Backup | | |
| **Network Services** | N<br>SDN | Dn<br>DNS | F<br>Firewall | V<br>VPN | Cn<br>CDN | | |
| **Security Services** | ID<br>Identity Mgmt | Ac<br>Access Control | Ky<br>Key Mgmt | Lt<br>Log Trail | | | |
| **Dev Delivery Services** | Pt<br>Patterns | Ca<br>SW Config | Ad<br>Active Deploy | Ft<br>Feature Toggles | Im<br>Image Builder | Mk<br>Failure Testing | |
| **Ops Delivery Services** | L<br>Logging | Mc<br>Monitoring | Sd<br>Svc Discovery | Sp<br>Svc Proxy | Am<br>Availability | Eg<br>Event Generation | Al<br>Alerting |
| **Integration Services** | A<br>API Mgmt | E<br>Event Hub | Tx<br>File Transfer | Sc<br>Secure Gateway | Sb<br>Service Broker | | |
| **Data Services** | Kv<br>Key Value Store | D<br>Doc DB | Db<br>SQL DB | Cf<br>Config Store | | | |

# One Environment, Three Runtime Choices



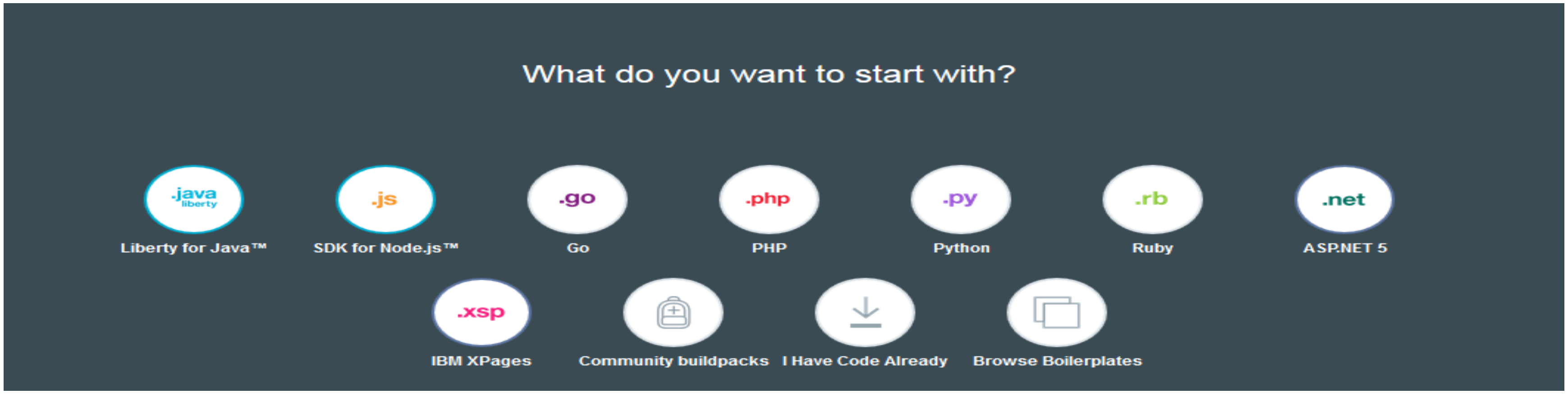
Cloud Foundry Apps
1 GB/1 GB Used

Containers
1.187 GB/2 GB | 1/2 Public IPs

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

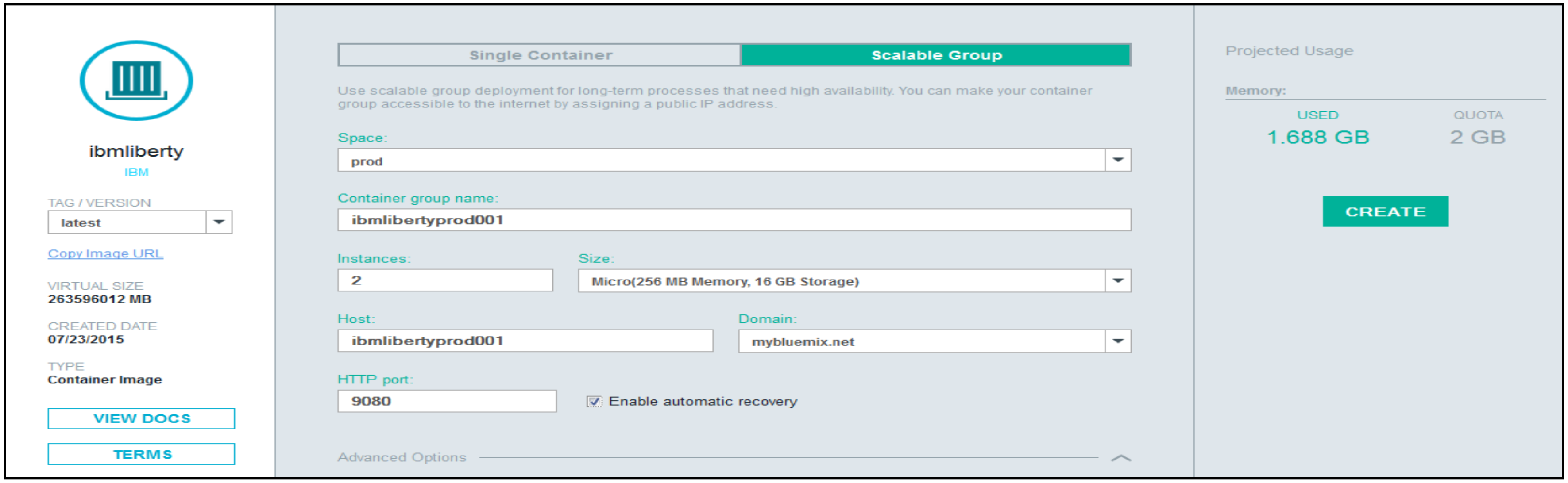
Services & APIs
4/4 Used

**Cloud Foundry**



What do you want to start with?

# IBM Containers



ibmliberty
IBM

TAG / VERSION
latest

Copy Image URL

VIRTUAL SIZE
263596012 MB

CREATED DATE
07/23/2015

TYPE
Container Image

VIEW DOCS

TERMS

Single Container | Scalable Group

Use scalable group deployment for long-term processes that need high availability. You can make your container group accessible to the internet by assigning a public IP address.

Space: prod

Container group name: ibmlibertyprod001

Instances: 2

Size: Micro(256 MB Memory, 16 GB Storage)

Host: ibmlibertyprod001

Domain: mybluemix.net

HTTP port: 9080

☑ Enable automatic recovery

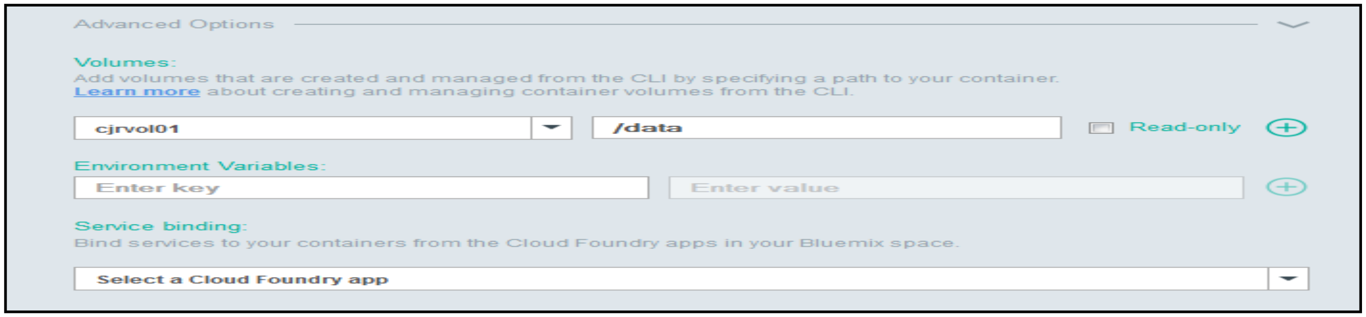
Advanced Options

Projected Usage

Memory:

| USED | QUOTA |
|---|---|
| 1.688 GB | 2 GB |

CREATE



Advanced Options

Volumes:
Add volumes that are created and managed from the CLI by specifying a path to your container.
Learn more about creating and managing container volumes from the CLI.

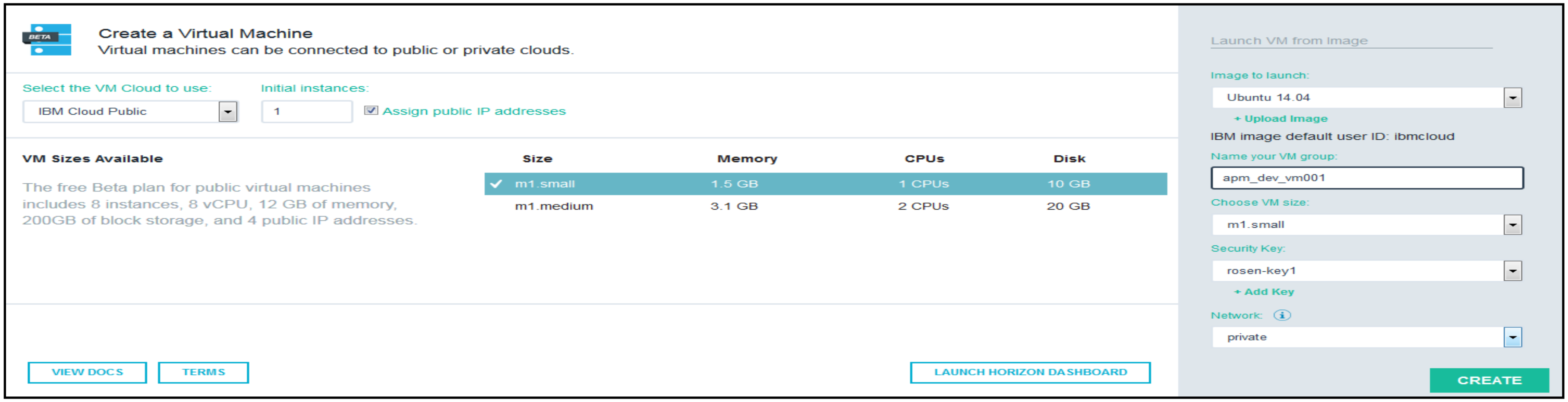
cjrvol01 | /data | □ Read-only ⊕

Environment Variables:
Enter key | Enter value ⊕

Service binding:
Bind services to your containers from the Cloud Foundry apps in your Bluemix space.

Select a Cloud Foundry app

# Virtual Machines



Create a Virtual Machine
Virtual machines can be connected to public or private clouds.

Select the VM Cloud to use: IBM Cloud Public

Initial instances: 1

☑ Assign public IP addresses

**VM Sizes Available**

The free Beta plan for public virtual machines includes 8 instances, 8 vCPU, 12 GB of memory, 200GB of block storage, and 4 public IP addresses.

| | Size | Memory | CPUs | Disk |
|---|---|---|---|---|
| ✓ | m1.small | 1.5 GB | 1 CPUs | 10 GB |
| | m1.medium | 3.1 GB | 2 CPUs | 20 GB |

Launch VM from Image

Image to launch: Ubuntu 14.04

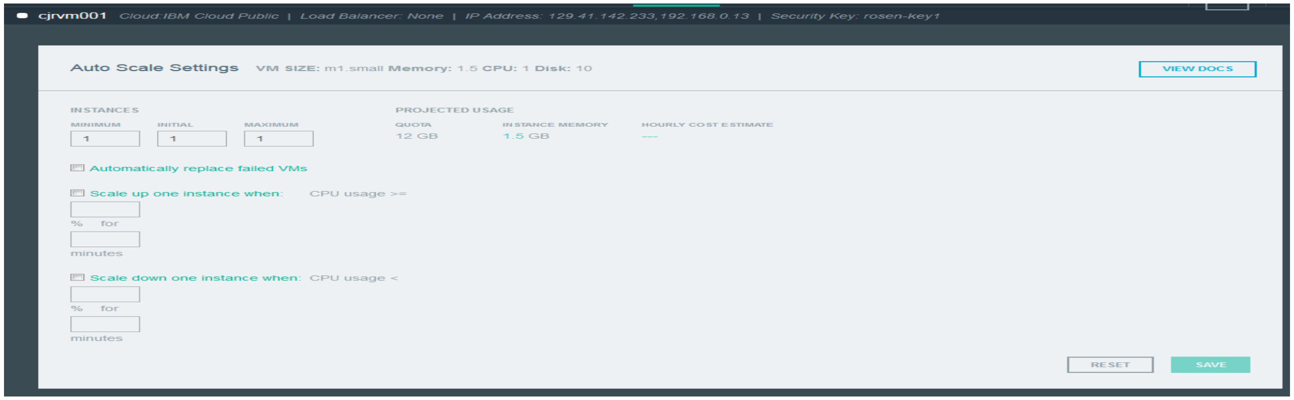
IBM image default user ID: ibmcloud

Name your VM group: apm_dev_vm001

Choose VM size: m1.small

Security Key: rosen-key1

Network: private



cjrvm001 Cloud:IBM Cloud Public | Load Balancer: None | IP Address: 129.41.142.233,192.168.0.13 | Security Key: rosen-key1

Auto Scale Settings VM SIZE: m1.small Memory: 1.5 CPU: 1 Disk: 10

INSTANCES

| MINIMUM | INITIAL | MAXIMUM |
|---|---|---|
| 1 | 1 | 1 |

PROJECTED USAGE

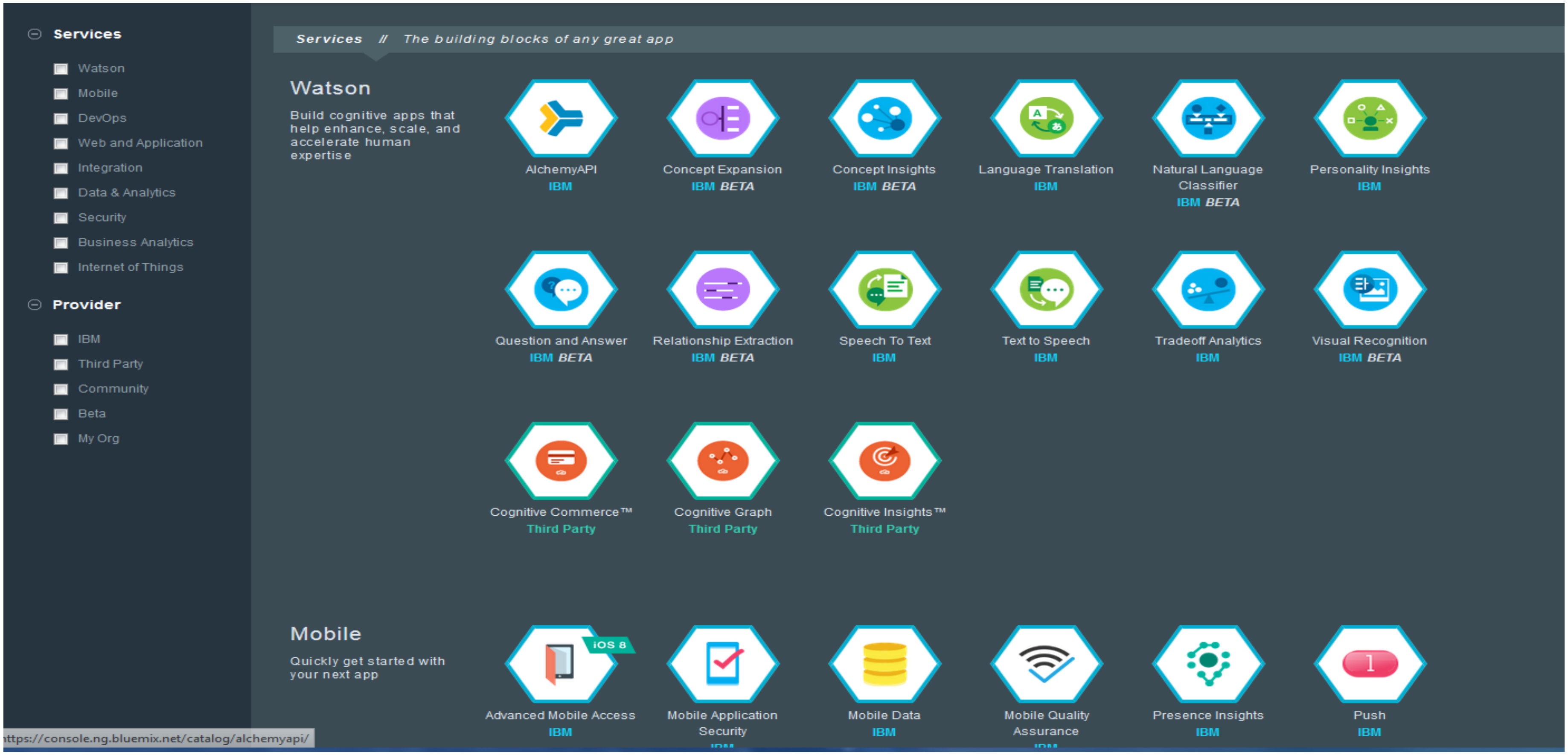
| QUOTA | INSTANCE MEMORY | HOURLY COST ESTIMATE |
|---|---|---|
| 12 GB | 1.5 GB | --- |

□ Automatically replace failed VMs

□ Scale up one instance when: CPU usage >= % for minutes

□ Scale down one instance when: CPU usage < % for minutes

# Services & APIs



Services // The building blocks of any great app

## Watson

Build cognitive apps that help enhance, scale, and accelerate human expertise

## Mobile

Quickly get started with your next app

Services
Watson
Mobile
DevOps
Web and Application
Integration
Data & Analytics
Security
Business Analytics
Internet of Things
Provider
IBM
Third Party
Community
Beta
My Org
AlchemyAPI IBM
Concept Expansion IBM BETA
Concept Insights IBM BETA
Language Translation IBM
Natural Language Classifier IBM BETA
Personality Insights IBM
Question and Answer IBM BETA
Relationship Extraction IBM BETA
Speech To Text IBM
Text to Speech IBM
Tradeoff Analytics IBM
Visual Recognition IBM BETA
Cognitive Commerce™ Third Party
Cognitive Graph Third Party
Cognitive Insights™ Third Party
iOS 8
Advanced Mobile Access IBM
Mobile Application Security IBM
Mobile Data IBM
Mobile Quality Assurance IBM
Presence Insights IBM
Push IBM
ttps://console.ng.bluemix.net/catalog/alchemyapi/

# CFS – Active Deploy Service

# Problem - Hypothesis

Enterprise Clients want to provide the exact same capability for their clients - fast response to feedback, fresh features, and rapid innovation. And in doing so, businesses cannot accept downtime when updating a critical running application. How can they do it?

Without Zero-downtime deployment

- Developers are required to take their application offline and then deploy a second version.
- They could possibly deploy a second version with different routes and switch them, but that is a lot of extra work.

With Zero-downtime deployment

- Developers are able to update their application seamlessly and letting the service do the hard work.
- Have additional flexibility with testing in production environment and size-by-side comparisons
- Fast rollback options

Conclusion: Cloud developers expect simple update capabilities that do not impact uptime or customer usage – these capabilities drives adoption of cloud platform systems and use DevOps services.

The solution they need is: Active Deploy on Bluemix

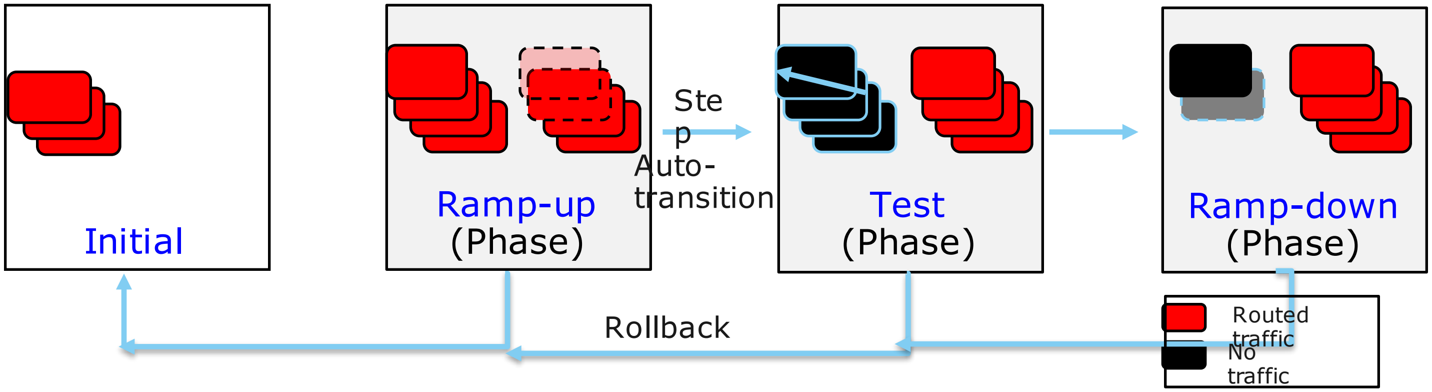
# What is Active Deploy Service ?

A service designed to manage the rollout of changes in an automated and controlled fashion, with zero-downtime, allowing multiple versions of an application to be “live” at one time for extended testing purposes.

## Advantages

- Application update with no downtime
- Full production testing with load and stress in place but little customer impact
- Side-by-side comparisons of the before-and-after operations
- Easy fallback to the last running version

# How does Active Deploy Service Operate?



Initial

Ramp-up (Phase)

Ste p Auto-transition

Test (Phase)

Ramp-down (Phase)

Rollback

🟥 Routed traffic

⬛ No traffic

Operationally 4 stages are needed

1. The initial stage is the initial running application
2. **Ramp-up phase** - where the new version is being deployed based on configuration settings – this can be automatic or manual, and take any length of configured time. It’s where parallel version comparison testing can take place
3. **Test phase** - is where the original version has been unrouted from accepting traffic, but the instances are still running - and the new version is now fully running. Extended production testing can now take place. And this also allow immediate rollback if needed.
4. **Ramp-down** - phase where the original version is deleted, and the new version continues live.

# How do the Active Deploy phases differ from blue-green deployments?

- In a traditional blue-green deployment, as defined in Martin Fowler's book *Continuous Delivery*, the two versions are never both enabled for routing at the same time.
- The Active Deploy service is a variant of the blue-green deployment in that the ramp-up phase has traffic that is enabled for both versions. The ramp-up phase helps you do canary testing before you transfer all traffic to the new version during the test phase. Your canary testing must be completed by manual inspection of the logs and metrics of the two versions.

# CFS – Active Deploy Service – Lab

https://github.com/ibmecod/cfs-activedeploy.git