Research Project Presentation

Cloud Computing & Analytics

CLOUD FOUNDRY

Marie Heinrich &
Tiffany Ong Lopez

NEW CUSTOMER REQUIREMENTS

NEW DATA SOURCES

NEW TECHNOLOGIES

RISING DEVELOPMENT COMPLEXITY

DEVELOPER FOCUS

Self-service

end-to-end solution

One command line or API to **abstract complexity**

Application **code independent** of scaling and couples **services**

Maximum **productivity** and **flexibility**

WHAT IS CLOUD FOUNDRY?

Founded in 2011

1

OPEN SOURCE

governed by the Cloud Foundry Foundation

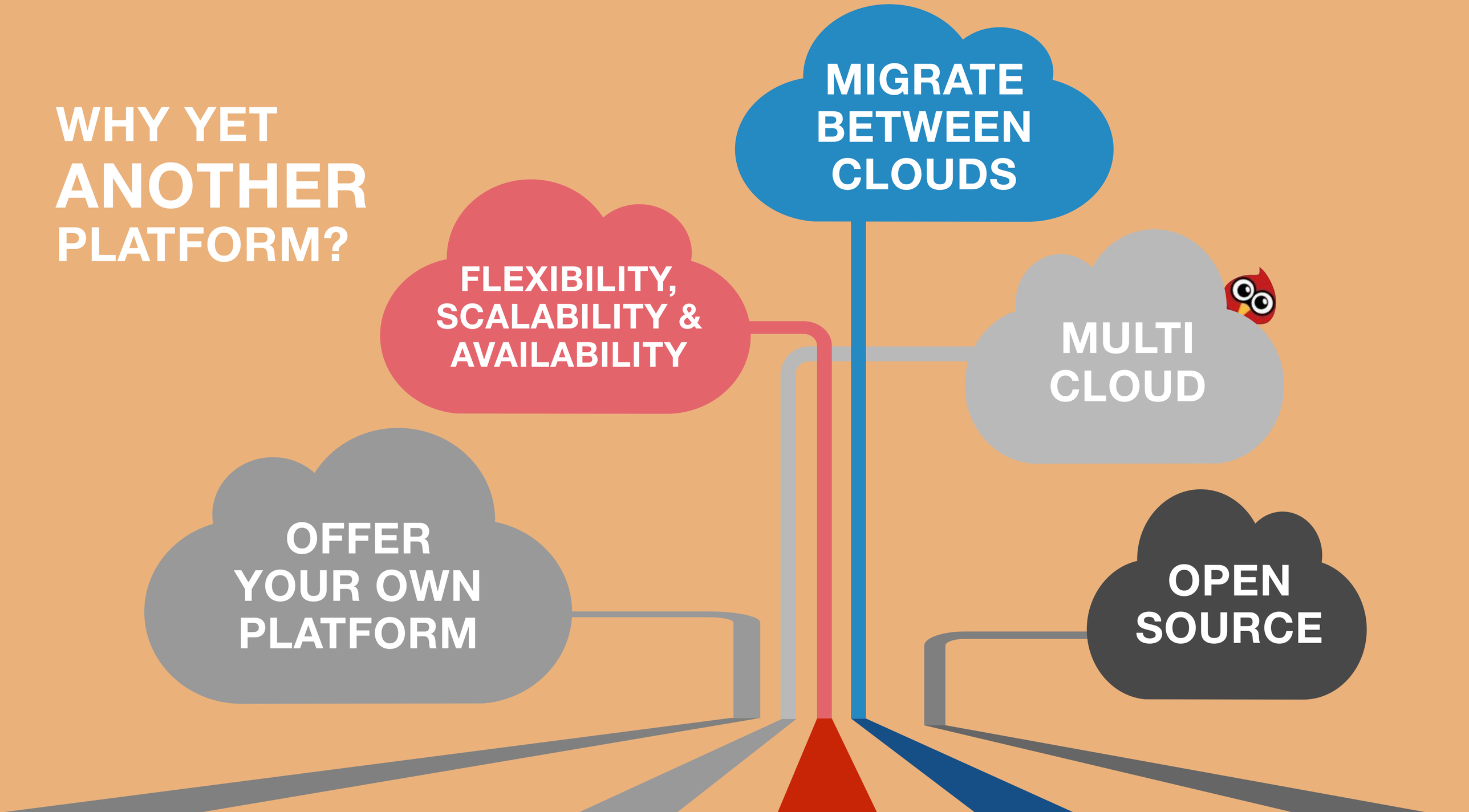
2

PLATFORM AS A SERVICE

3

FOR CORPORATE MULTI-CLOUD STRATEGIES

WHY YET ANOTHER PLATFORM?



WHAT IS THE OFFERING SCOPE OF CLOUD FOUNDRY

01 **DEVELOPMENT FRAMEWORKS**

SPRING, JAVA, RUBY ON RAILS/SINATRA, NODE.JS, GRAILS, PHP, PYTHON

02 **DEVELOPER TOOLS**

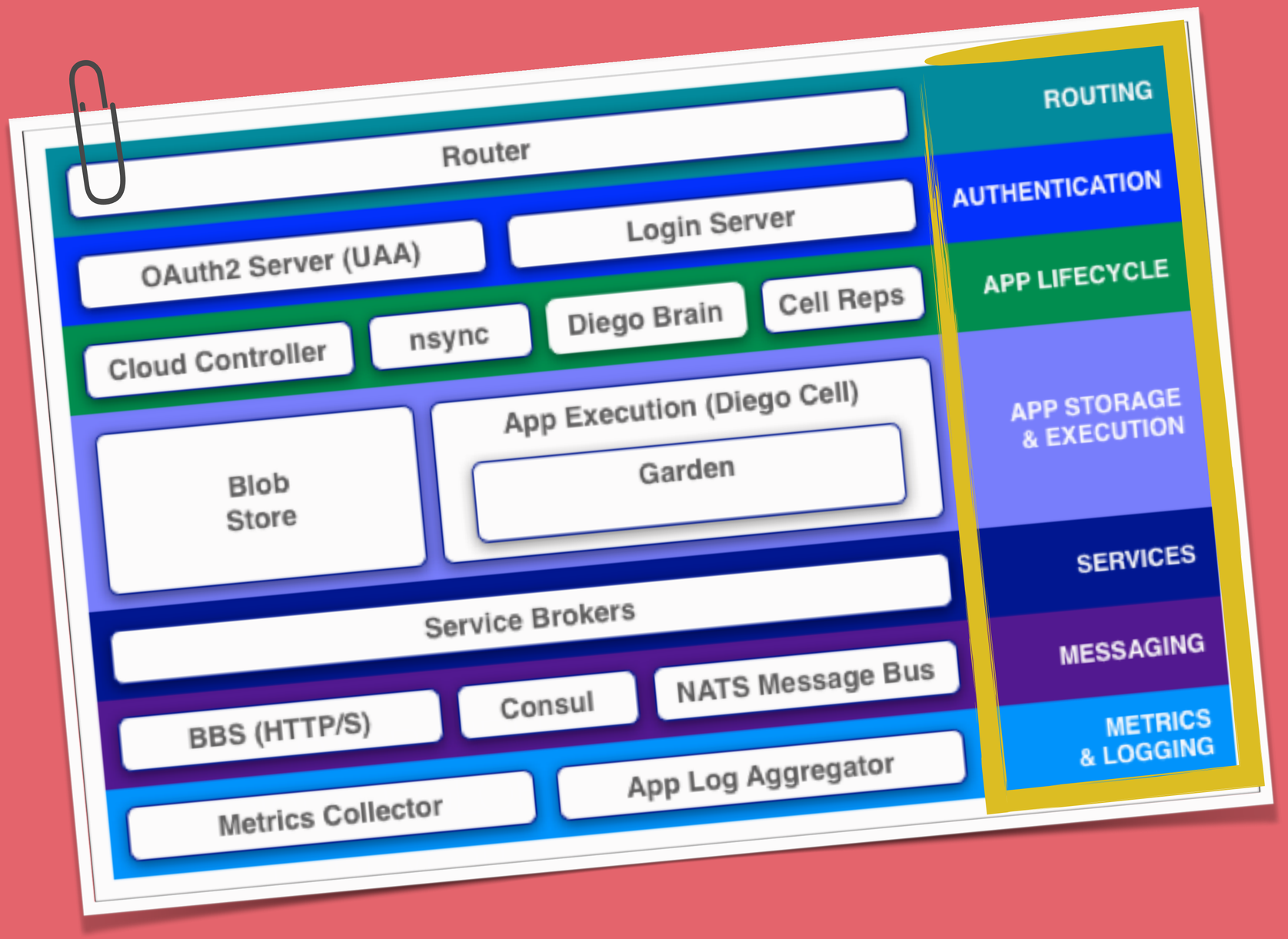
COMMAND LINE INTERFACE (VMC), ECLIPSE BASED IDE ('STS')

03 **APPLICATION SERVICE INTERFACE**

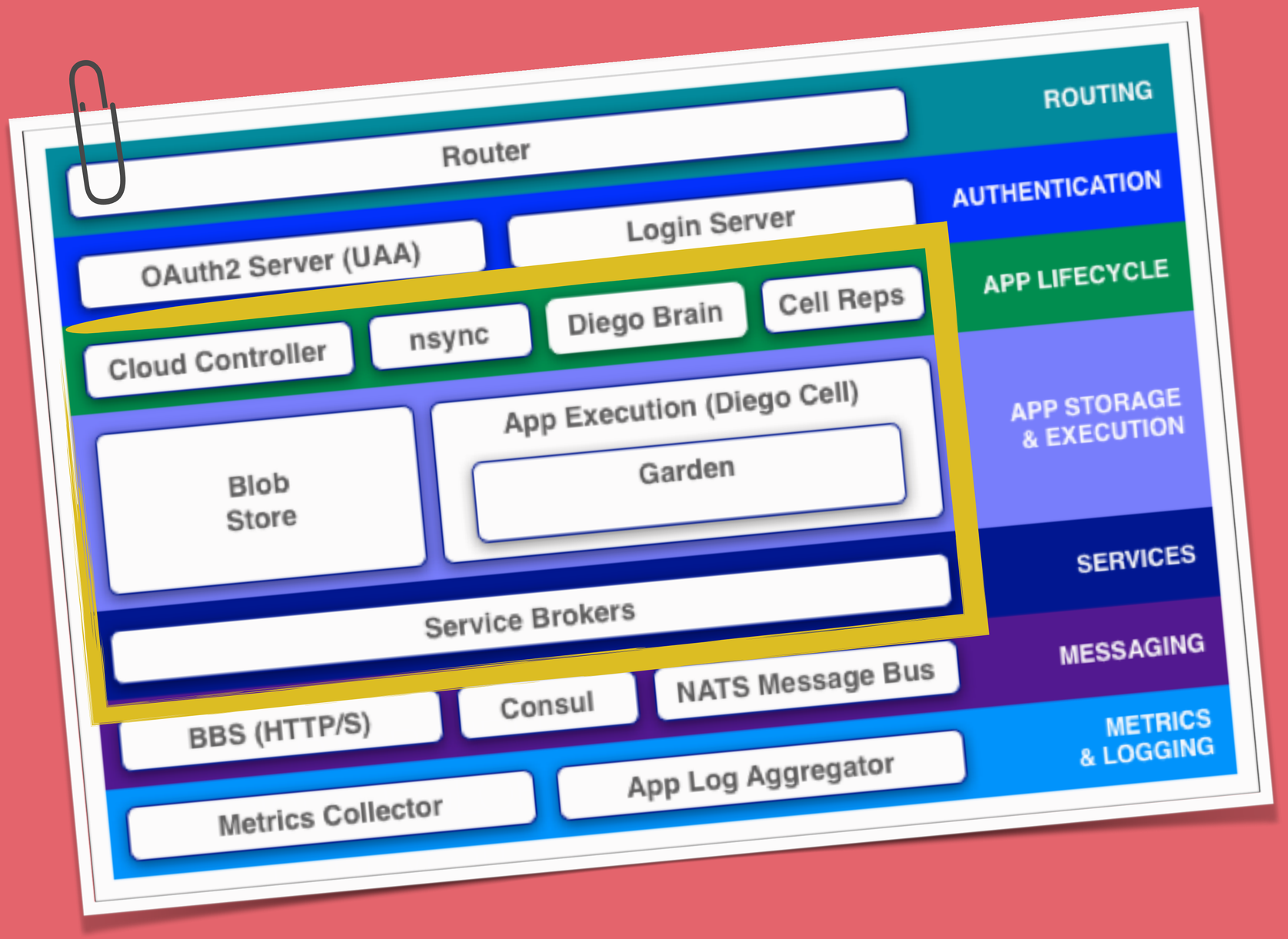
DATA SERVICES (VFABRIC, POSTGRES, MYSQL)
MESSAGE SERVICES (RABBITMQ)
OTHERS (REDIS DB, MONGODB)

04 **MULTI CLOUD**

MICRO CLOUD
PUBLIC CLOUD
PRIVATE CLOUD

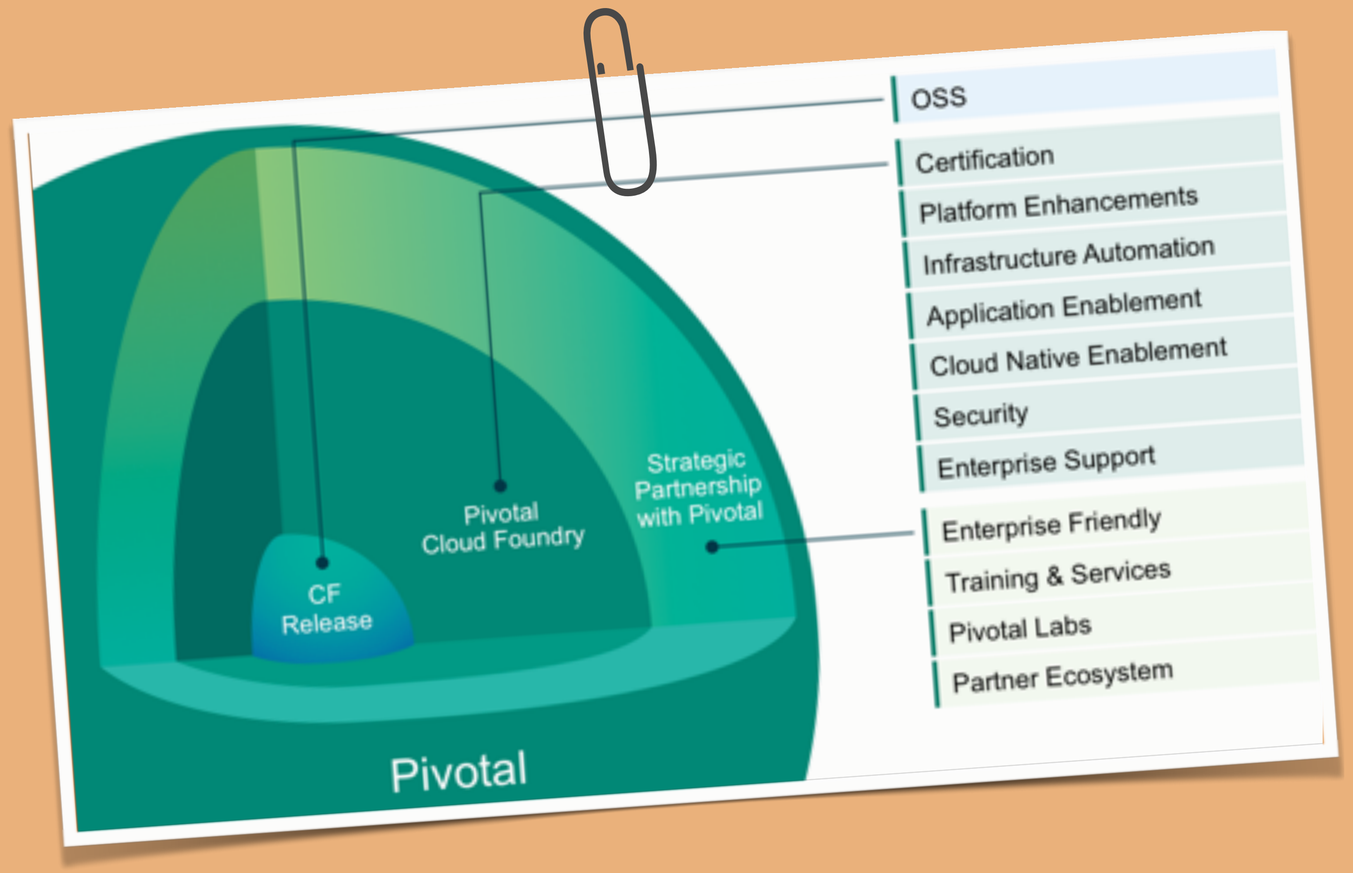


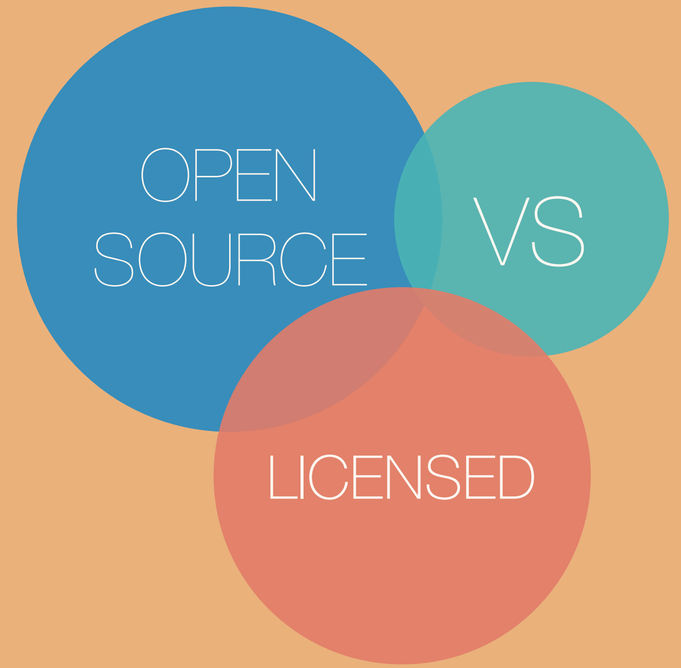
THE ARCHITECTURE



THE ARCHITECTURE

DISTRIBUTION FORMS





CERTIFIED PARTNERS

HUAWEI
SUSE
IBM
Pivotal
swisscom
Atos
CLOUD.GOV
FUJITSU
SAP

DEPLOYMENT OPTIONS

1

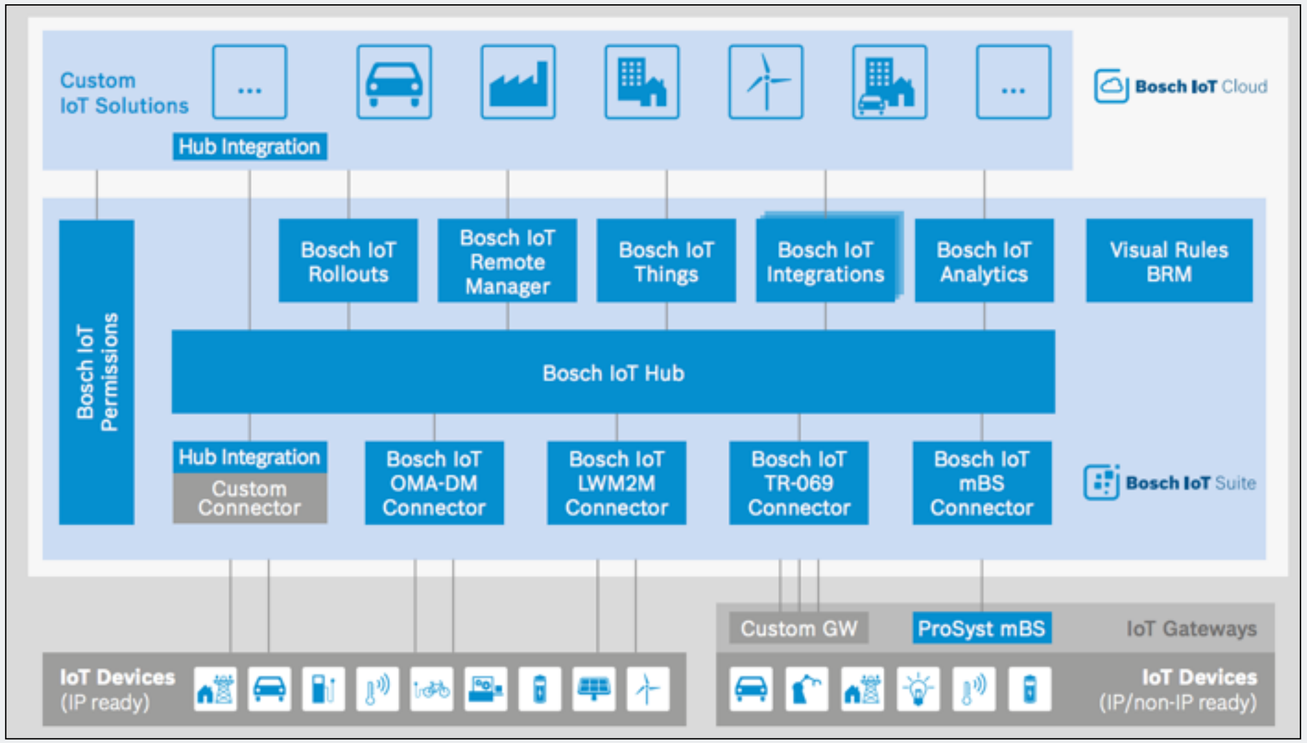
CLOUDFOUNDRY APPLICATION RUNTIME™

2

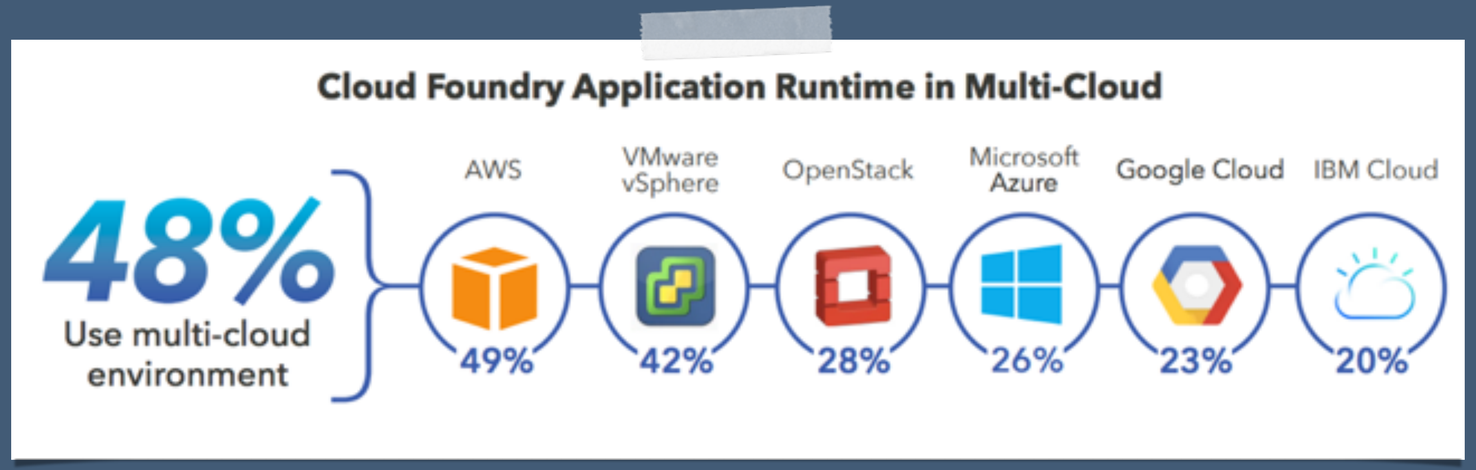
CLOUDFOUNDRY CONTAINER RUNTIME™

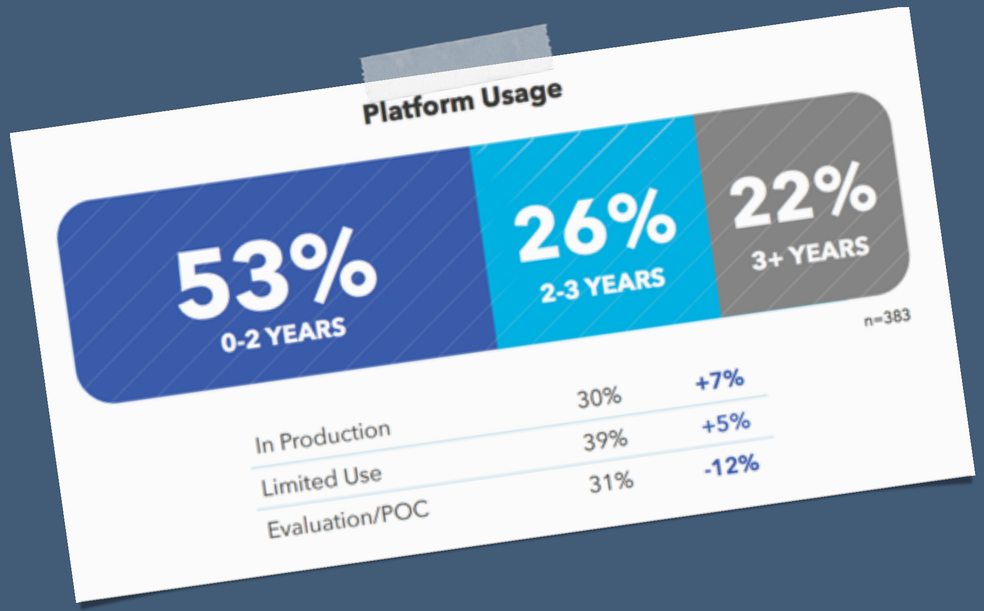
WHAT DO YOU WANT TO FOCUS ON?

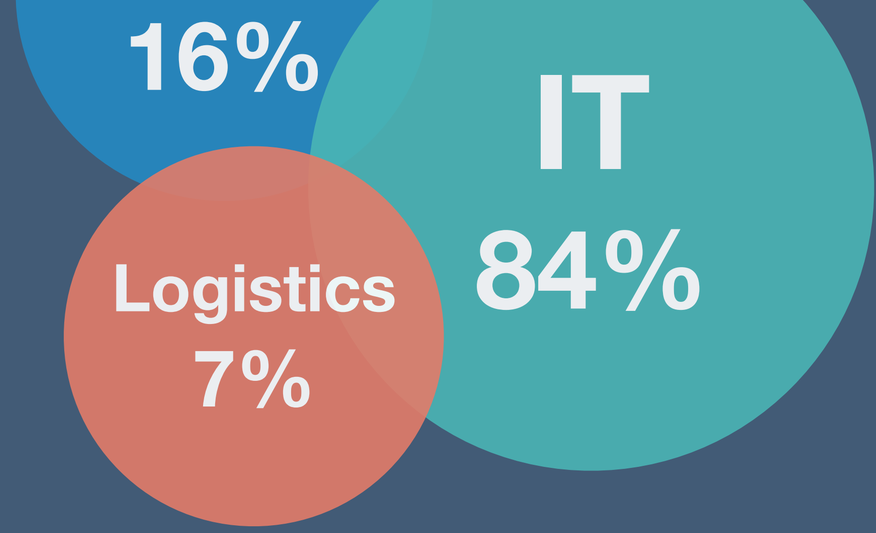
USE CASE
BOSCH
IOT CLOUD
BASED ON CLOUD FOUNDRY

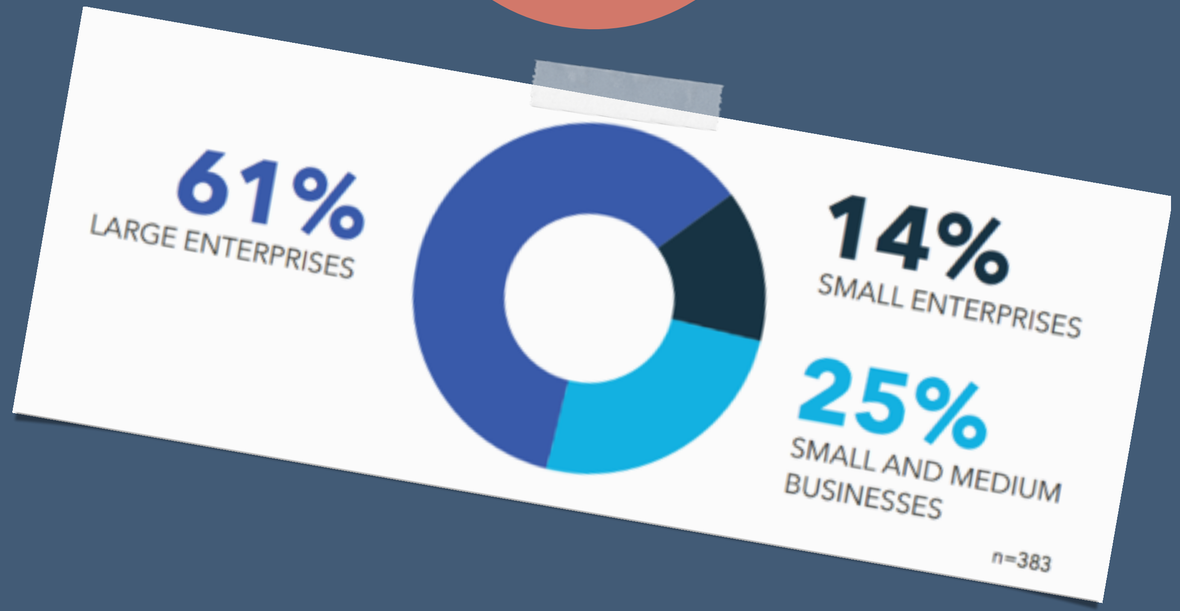


MATURITY ASSESSMENT I
COMMUNITY

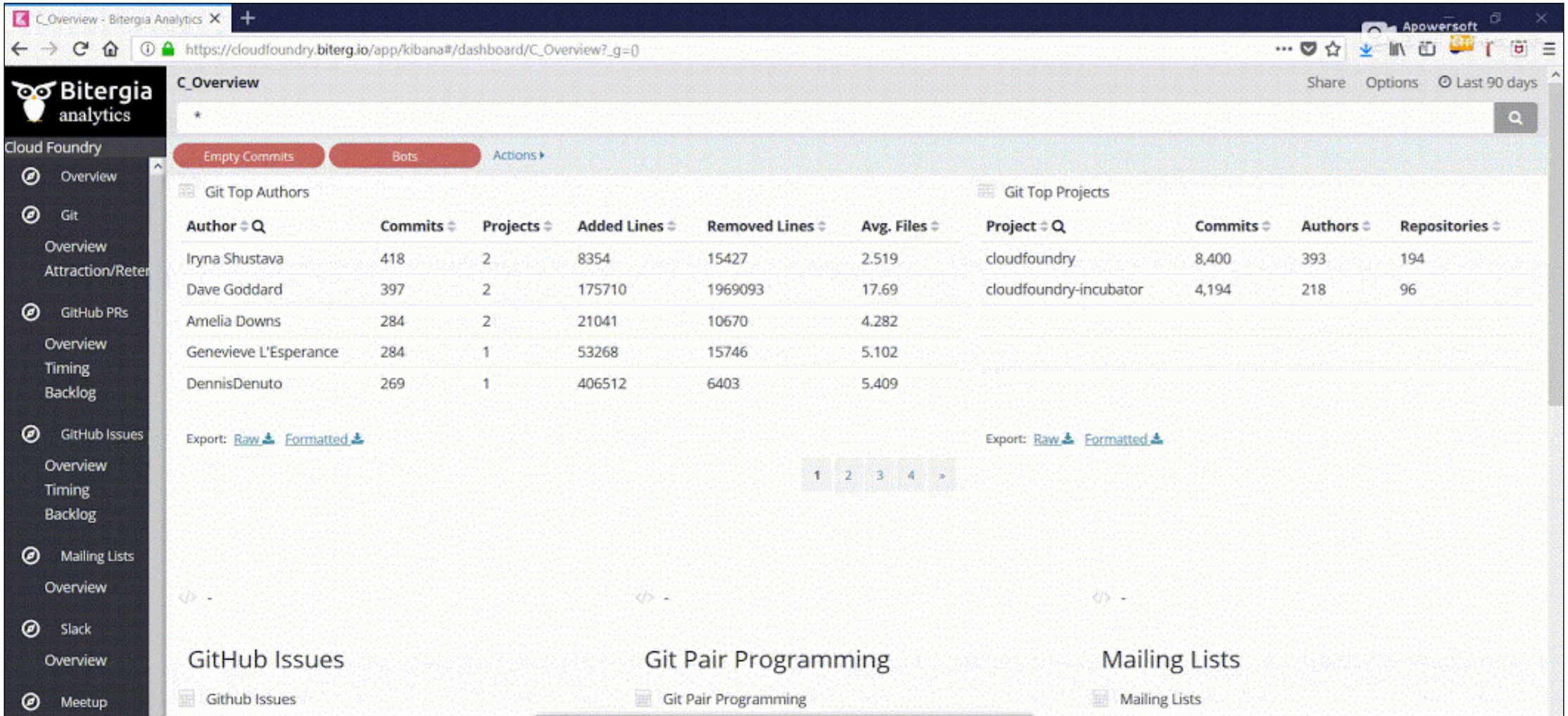




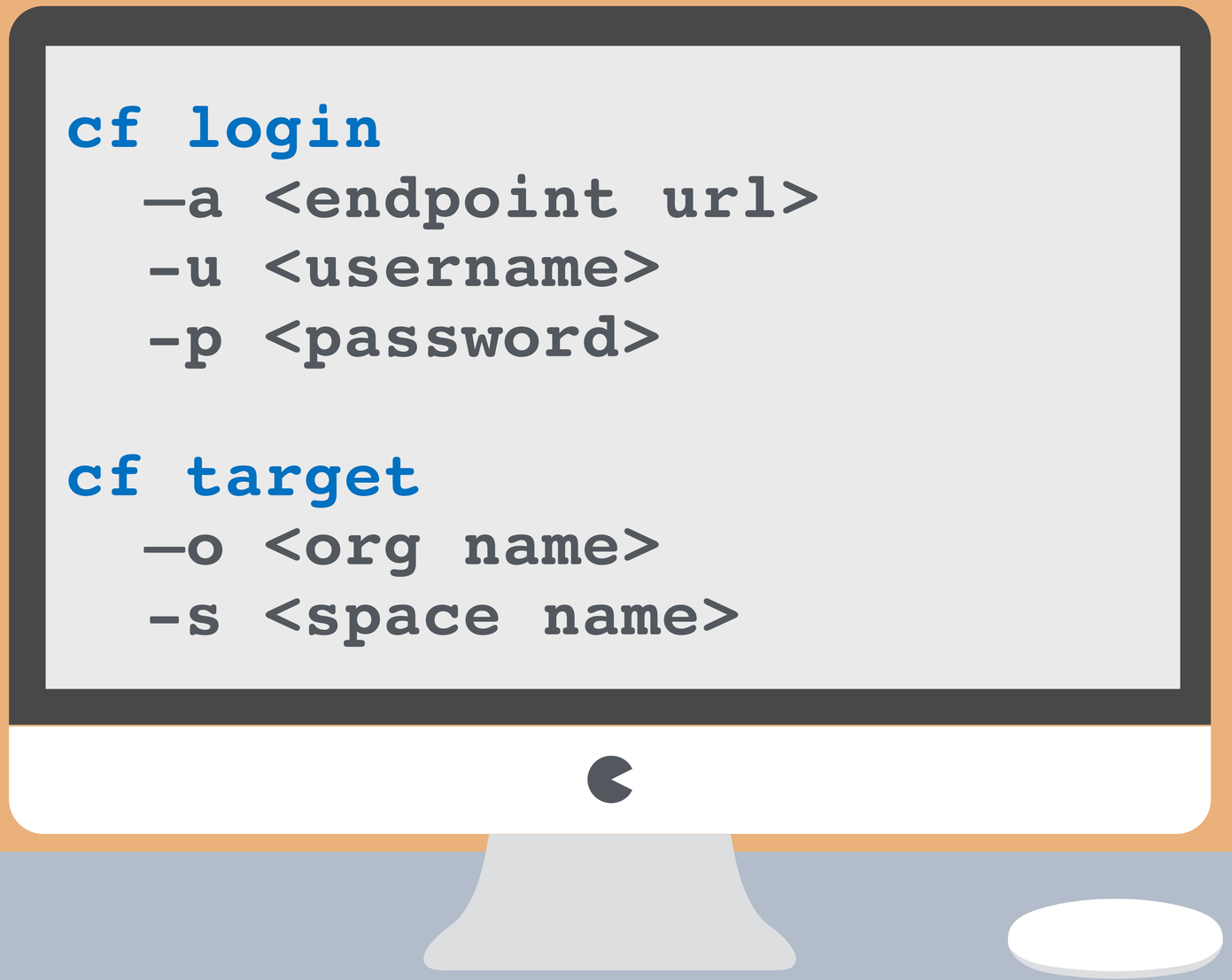




MATURITY ASSESSMENT II
COMMUNITY



PRE-DEPLOYMENT



Endpoint URL

- URL of cloud controller in Cloud Foundry instance

Organizations

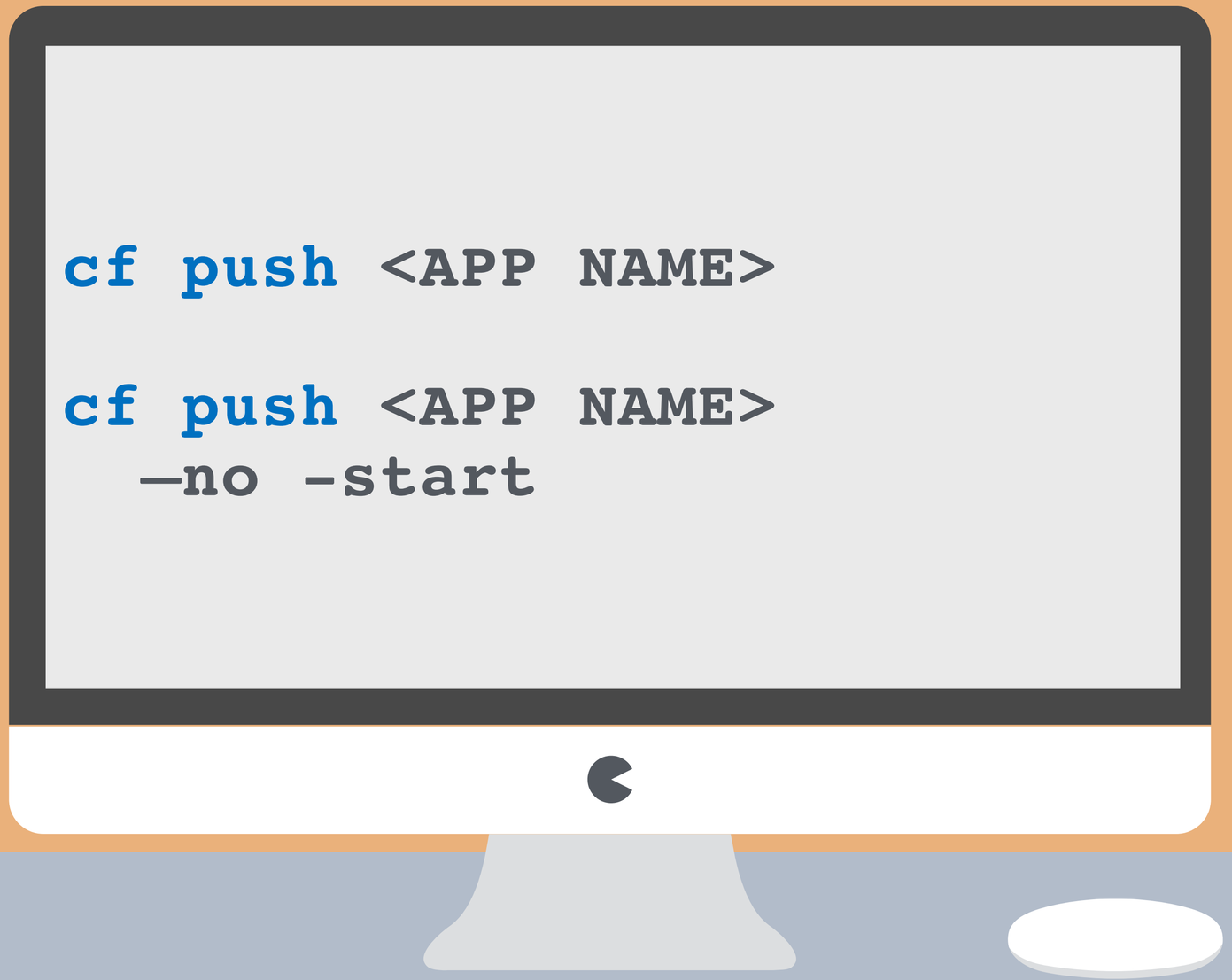
- Share a resource quota plan, applications, services availability, and custom domains

Spaces

- Provides users with access to a shared location for application development, deployment, and maintenance

https://docs.cloudfoundry.org/concepts/roles.html

DEPLOYMENT

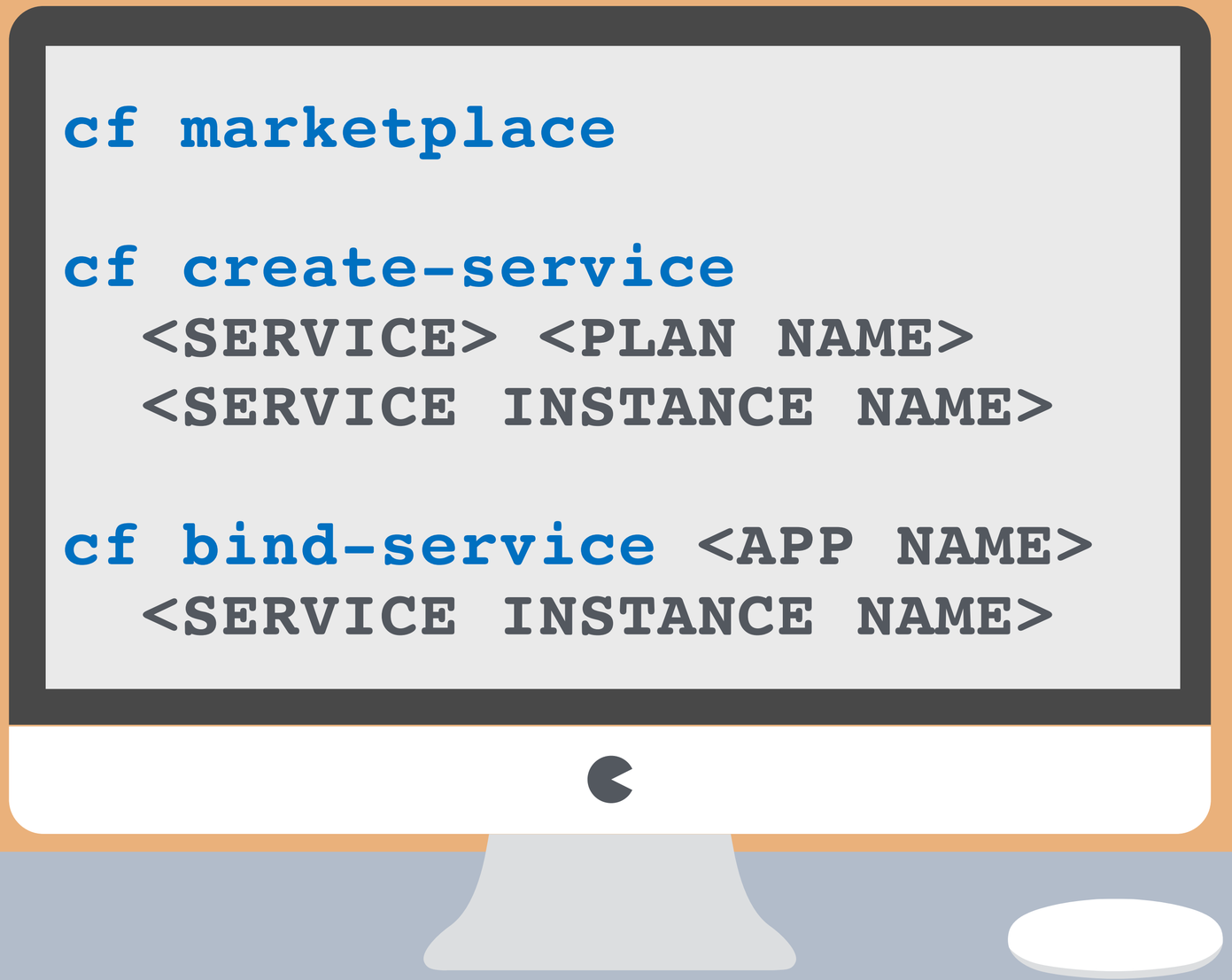


Steps

- Uploads and stores app files
- Examines and stores app metadata
- Creates a “droplet” (the Cloud Foundry unit of execution) for the app
- Selects an appropriate Diego cell to run the droplet
- Starts the app

https://docs.cloudfoundry.org/devguide/deploy-apps/deploy-app.html

PROVISIONING SERVICES



Cloud Foundry Marketplace

- Provision service instances

Services

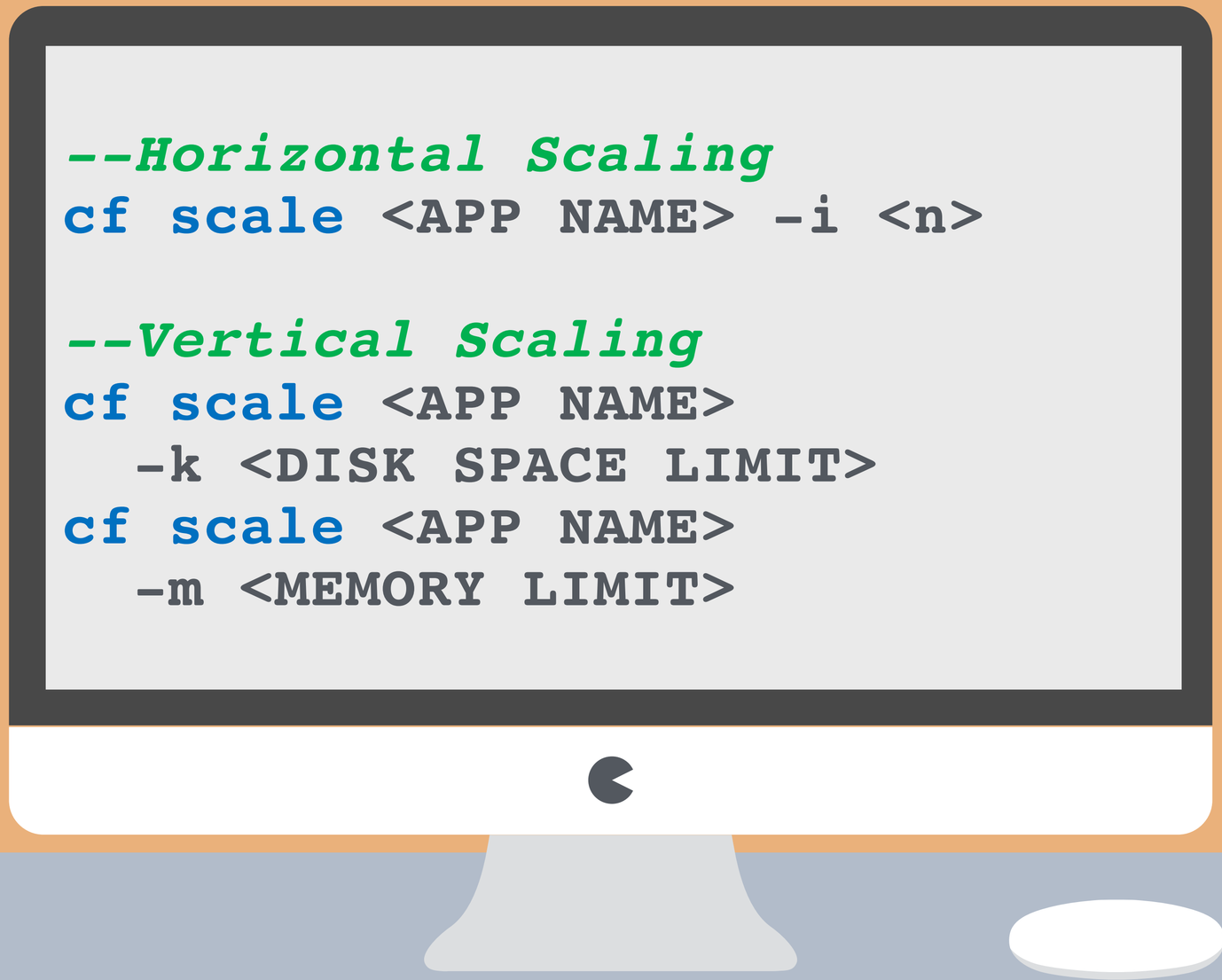
- Factory that delivers service instances

Service Instance

- Reserved resources
- e.g. databases, or accounts on an SaaS application

https://docs.cloudfoundry.org/devguide/services/

SCALING



Horizontal scaling

- creates or destroys instances of your application

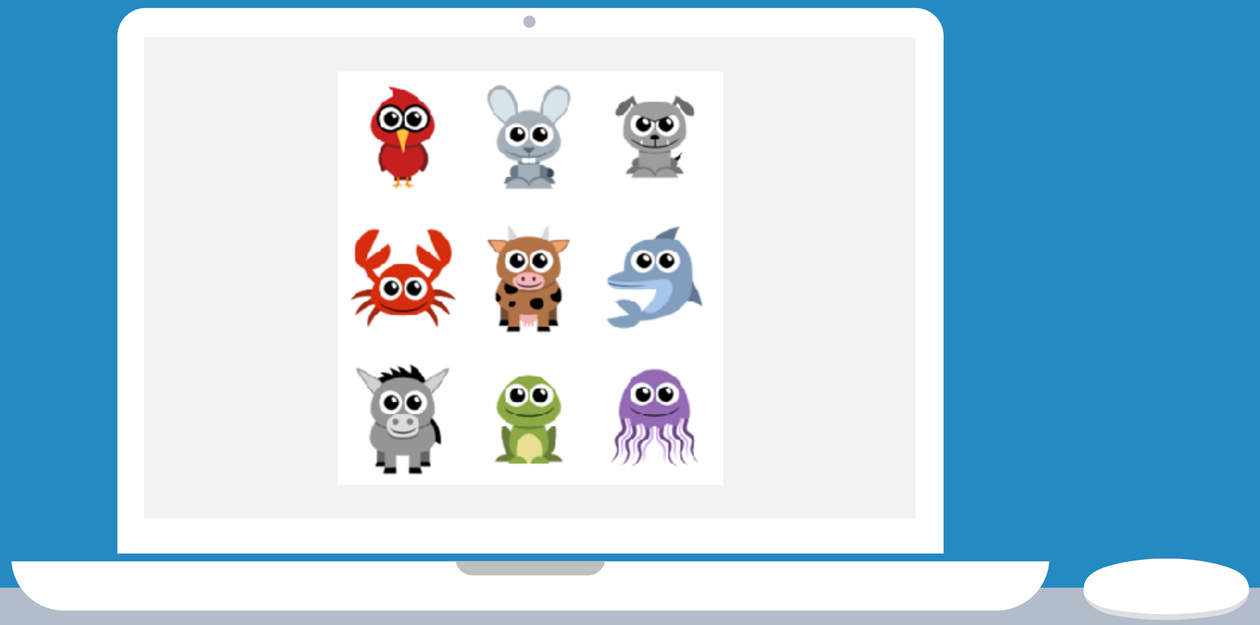
Vertical scaling

- changes the disk space limit or memory limit that Cloud Foundry applies to all instances of the application
- Specify in M or G

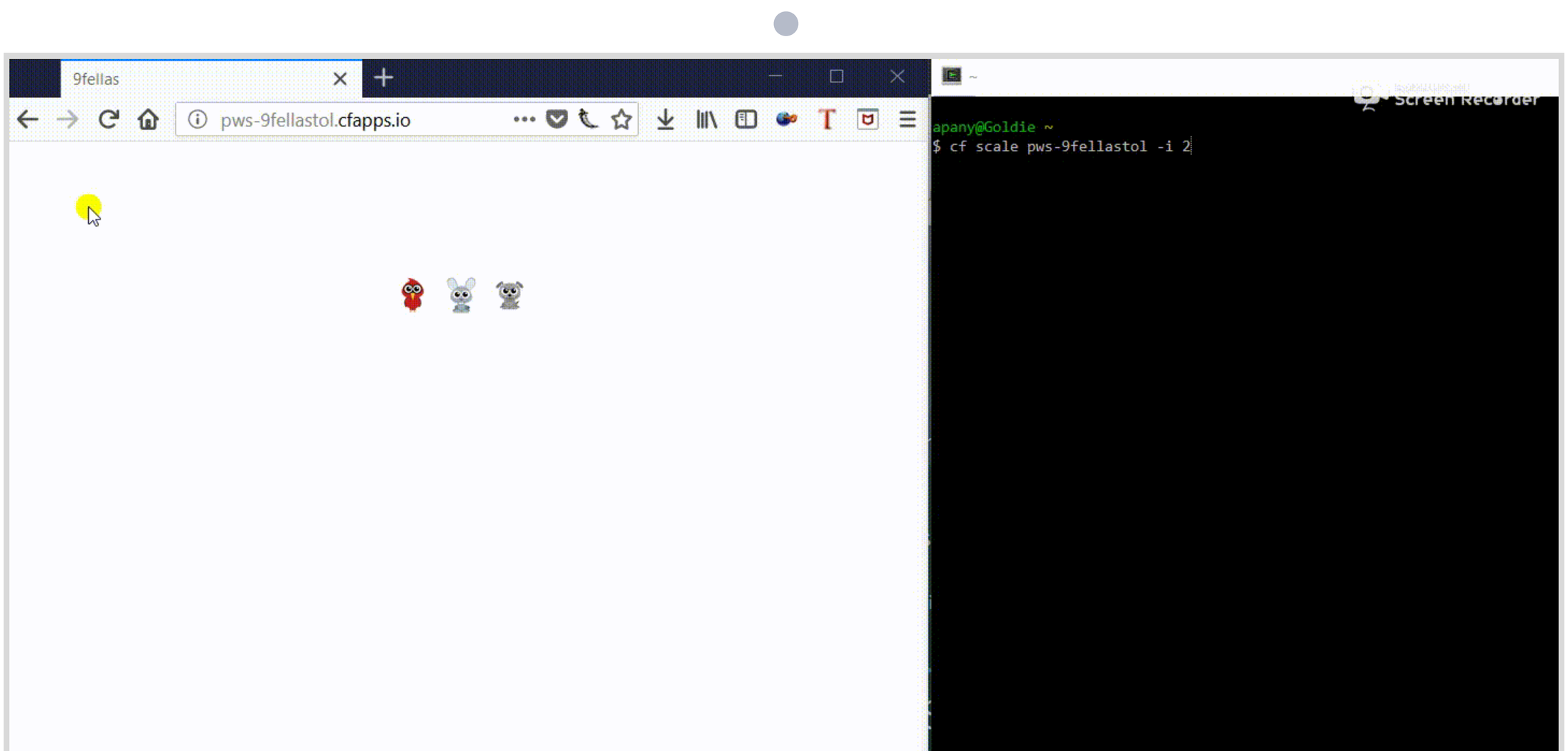
https://docs.cloudfoundry.org/devguide/deploy-apps/cf-scale.html

SAMPLE APPLICATION

- “9fellas” toy application
- Created by Pivotal
- Demonstrates multi-cloud functionality
- Displays a “fella” for each thread added to the application
- Adds a new group of fellas for each instance of the application
- Back end: Redis database



CF SCALE AND ADDING/REMOVING THREADS



3-May-2018 Deploy CF toy app

PERSONAL EXPERIENCE

CF setup is resource heavy

Requires: (AWS)

- 22 VM instances
- 5 S3 buckets
- 12 security groups
- 3 load balancers
- 6 network interfaces

That's just for the **"starter" setup**… a complete, multi-AZ deployment requires 40 VM instances

Deployment process varies per cloud provider

- **AWS**: Templates available (Cloud Formation)
- **Azure**: Templates available (Azure Marketplace)
- **GCP**: Manual (console screens)

Cost

- Even a minimal (open source) CF installation will cost **US$696.82/month**
- Geared for large enterprises!

Try first on certified providers

- Complete PCF installation requires hours of setup, not including troubleshooting
- Use PCF trial accounts for testing a proof-of-concept

Documentation exists but..

- …they are **mostly created by Pivotal**, certified providers or other cloud vendors
- Not so much documentation in layman's terms

IN A NUTSHELL: ADVANTAGES & DISADVANTAGES

- Open Source & Licensed versions
- Multi Cloud
- Avoid vendor lock-in
- Extensible architecture
- Maximum flexibility, availability & scalability

- Cost of using managed/ certified CF instances
- Made for enterprises, not individuals (complex deployment process)









THANK YOU.