

Research Project Presentation

Cloud Computing & Analytics



Marie Heinrich &
Tiffany Ong Lopez



NEW CUSTOMER REQUIREMENTS



NEW DATA SOURCES

NEW TECHNOLOGIES



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**

RISING DEVELOPMENT COMPLEXITY



WHAT IS CLOUD FOUNDRY?

Founded in 2011



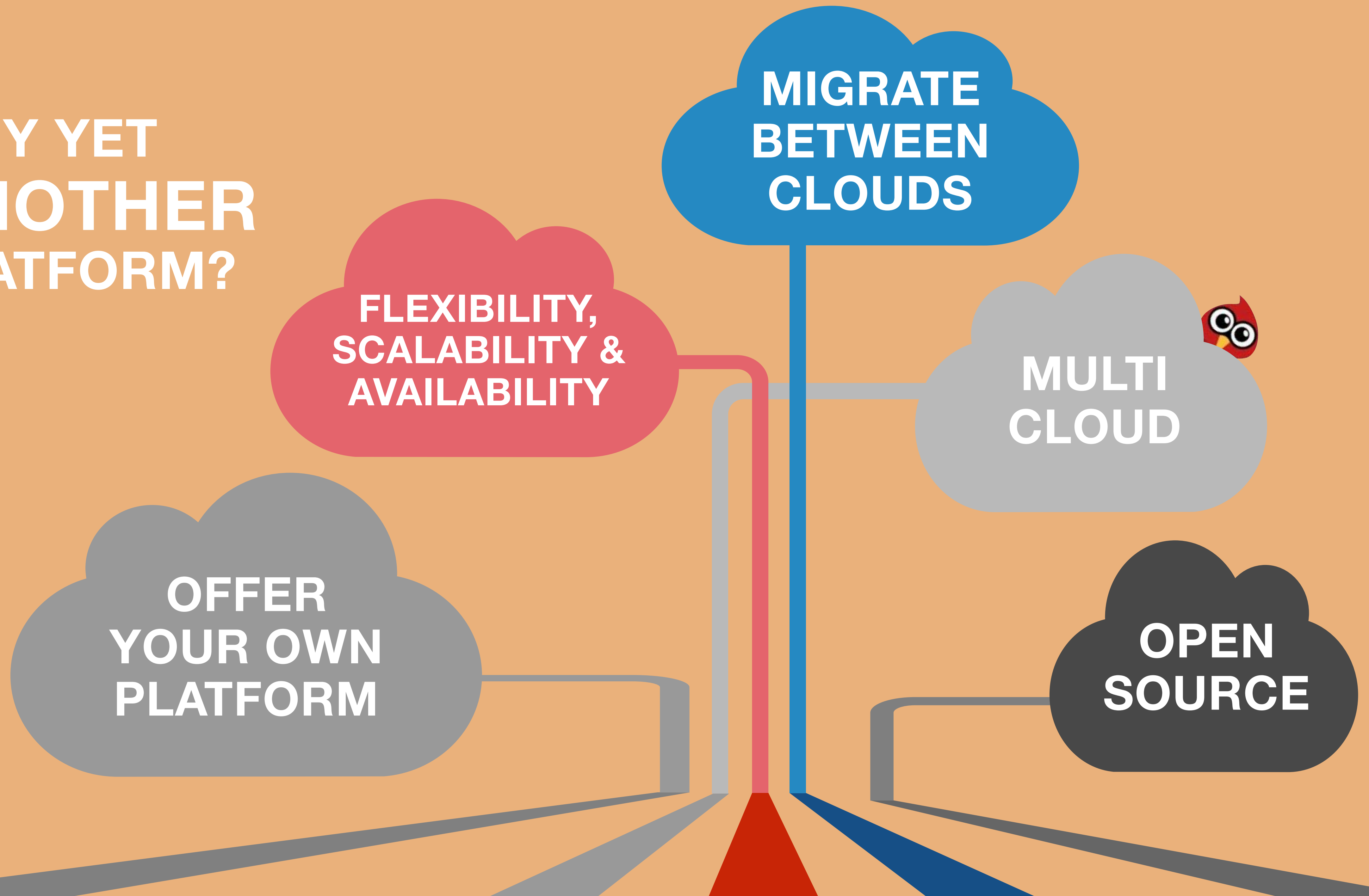
**OPEN
SOURCE**

governed by the
Cloud Foundry
Foundation

**PLATFORM
AS A
SERVICE**

**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

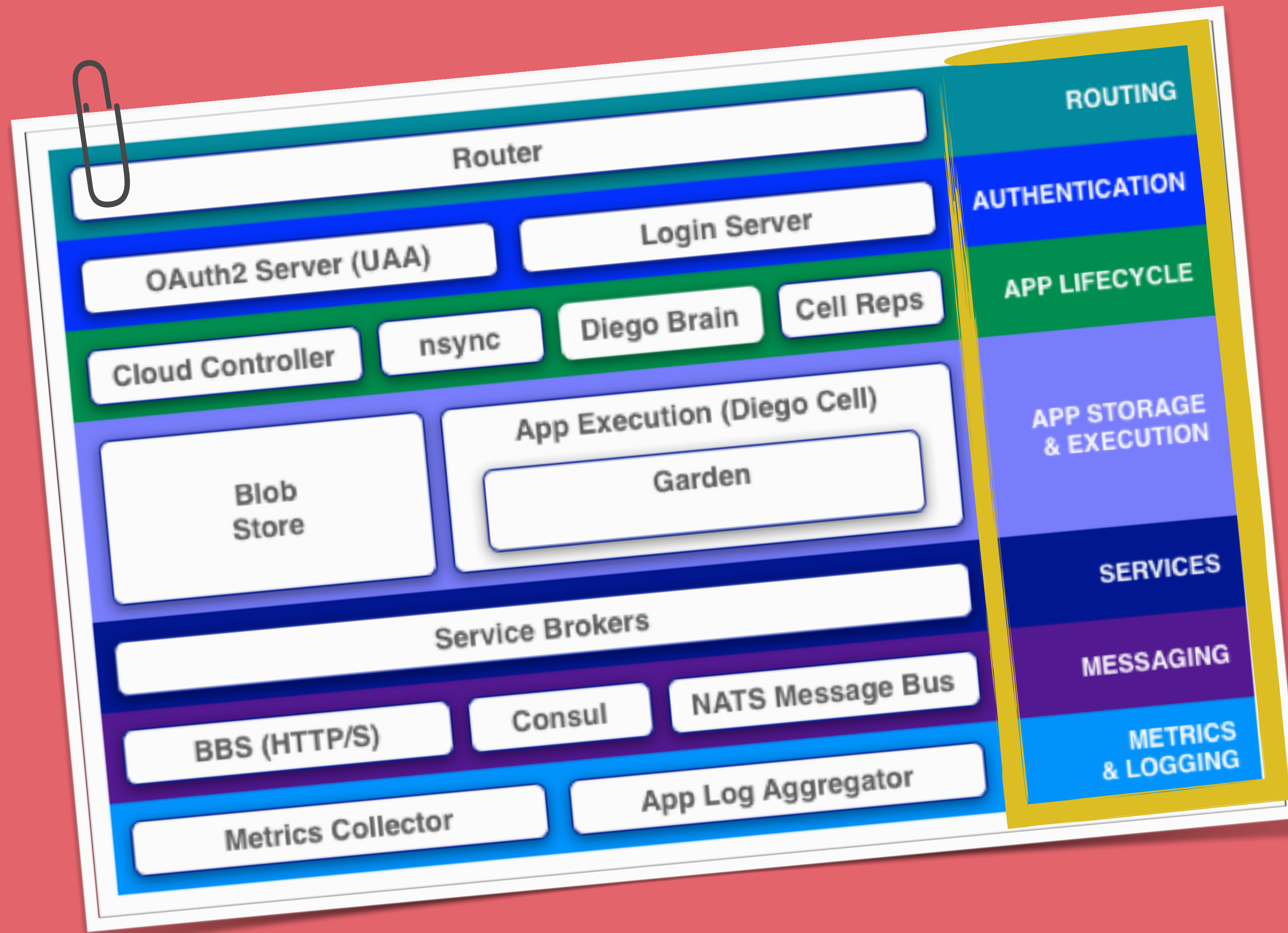
DATA SERVICES (VFABRIC, POSTGRES, MYSQL)
MESSAGE SERVICES (RABBITMQ)
OTHERS (REDIS DB, MONGODB)

04

MULTI CLOUD

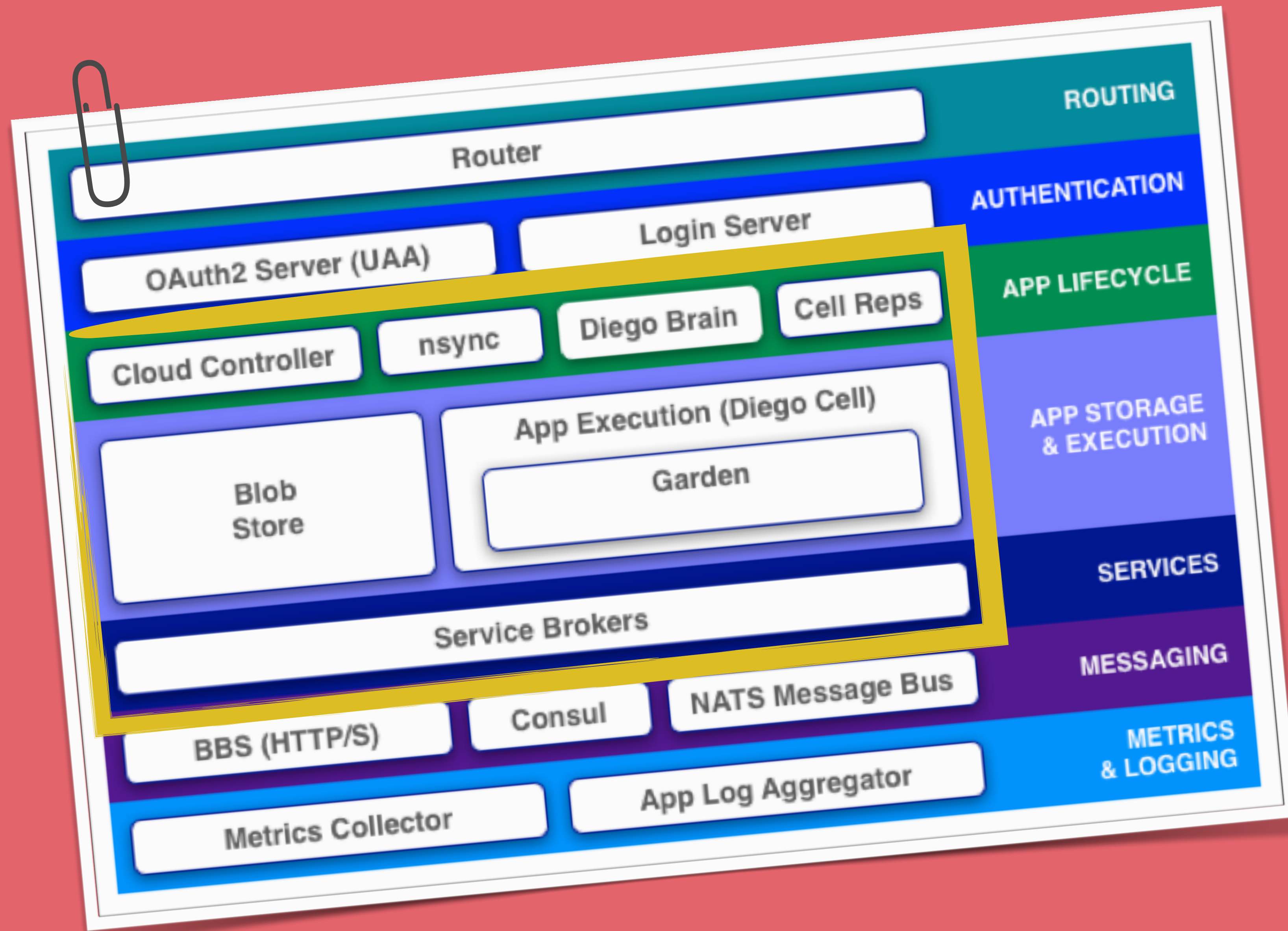
MICRO CLOUD
PUBLIC CLOUD
PRIVATE CLOUD





THE ARCHITECTURE

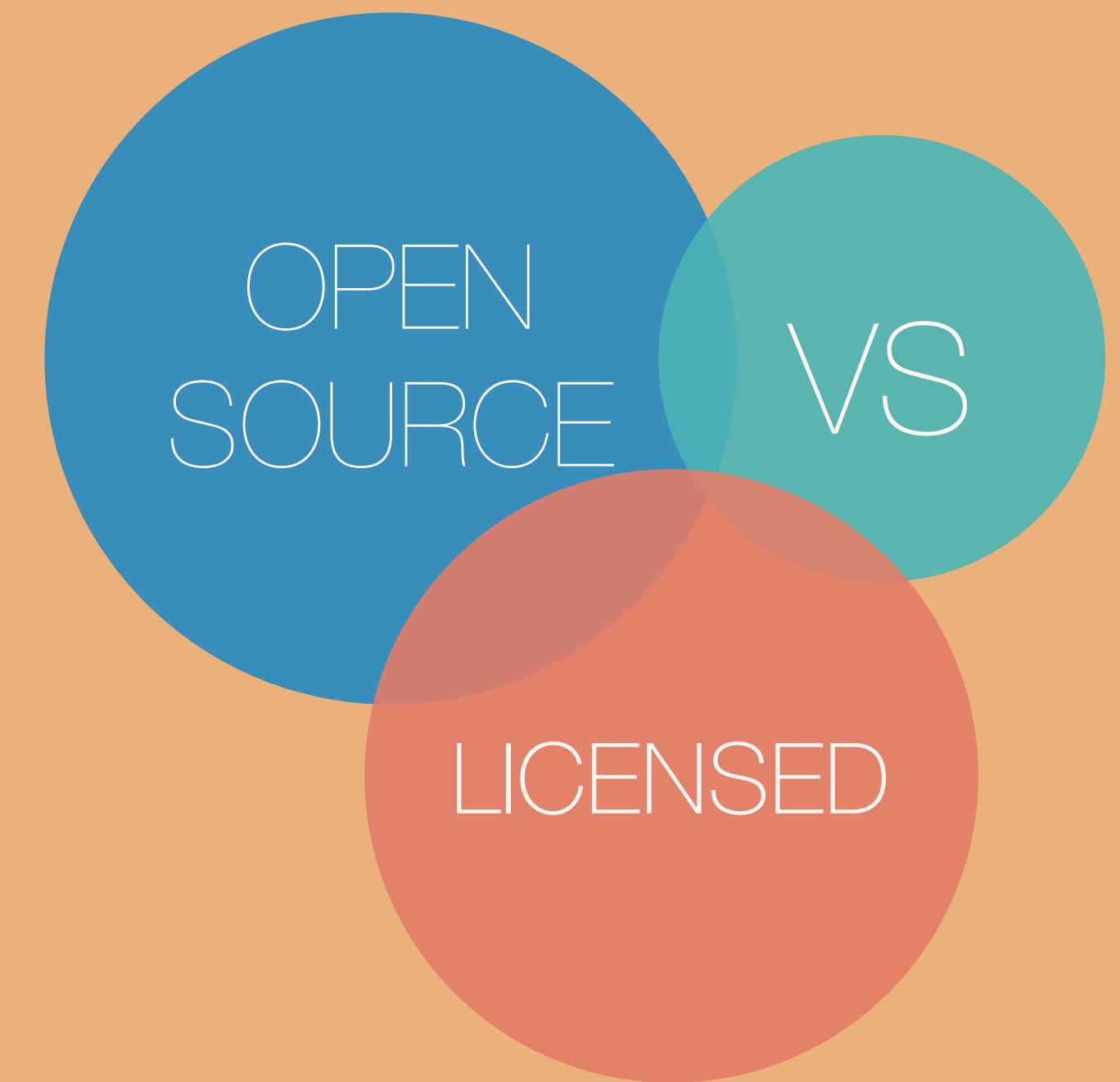
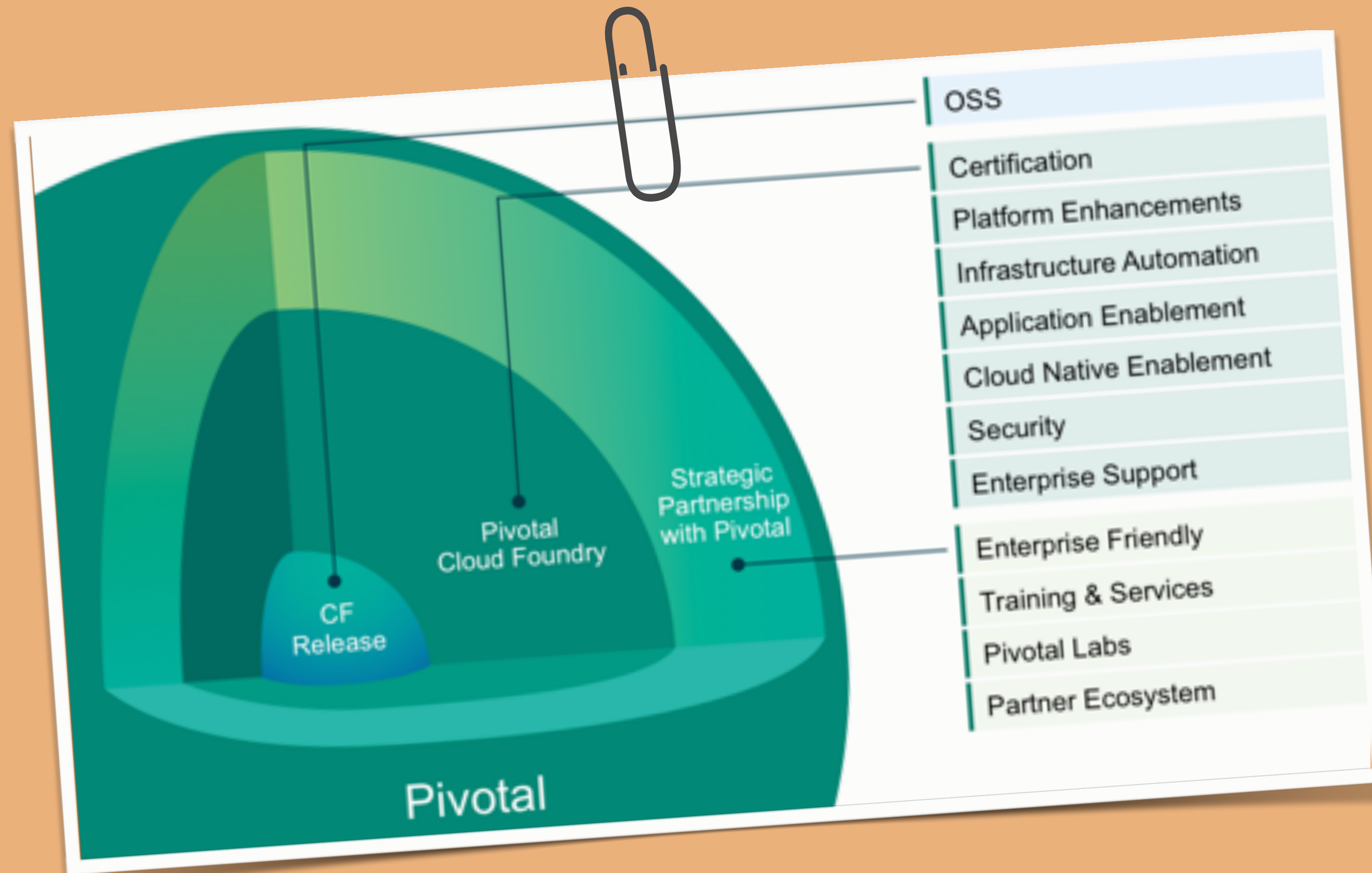




THE ARCHITECTURE



DISTRIBUTION FORMS



CERTIFIED PARTNERS



DEPLOYMENT OPTIONS

1



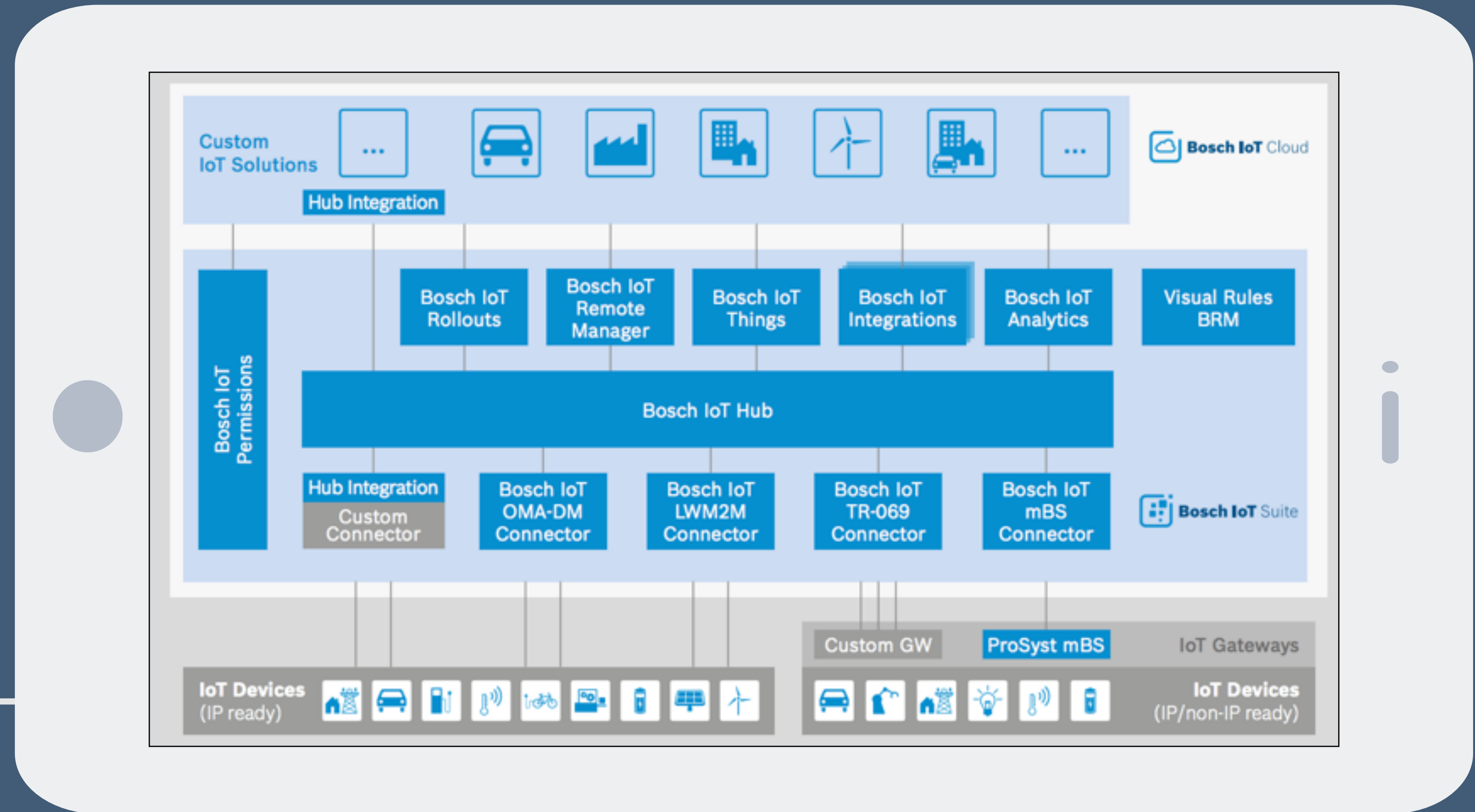
2



WHAT DO YOU WANT
TO FOCUS ON?

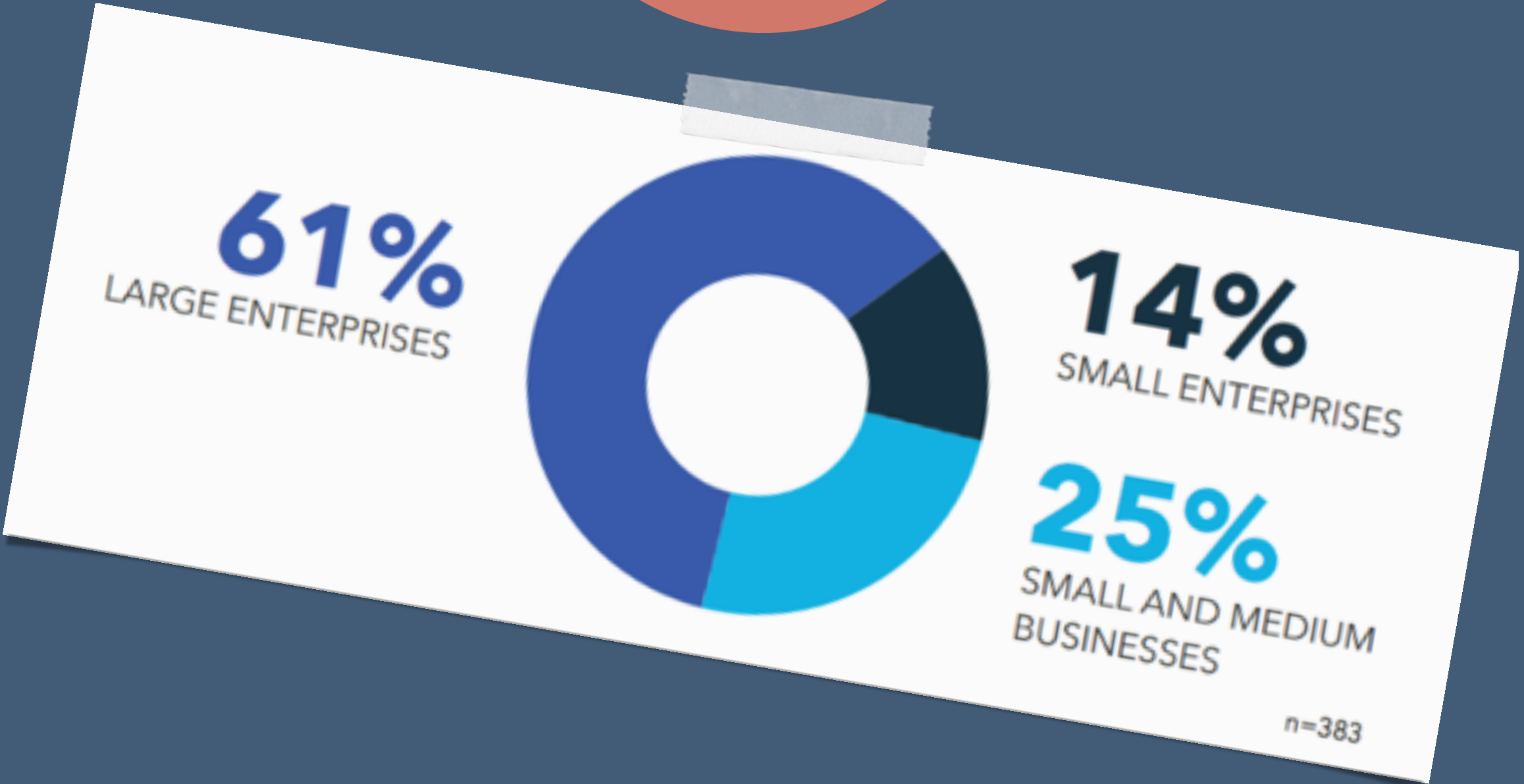
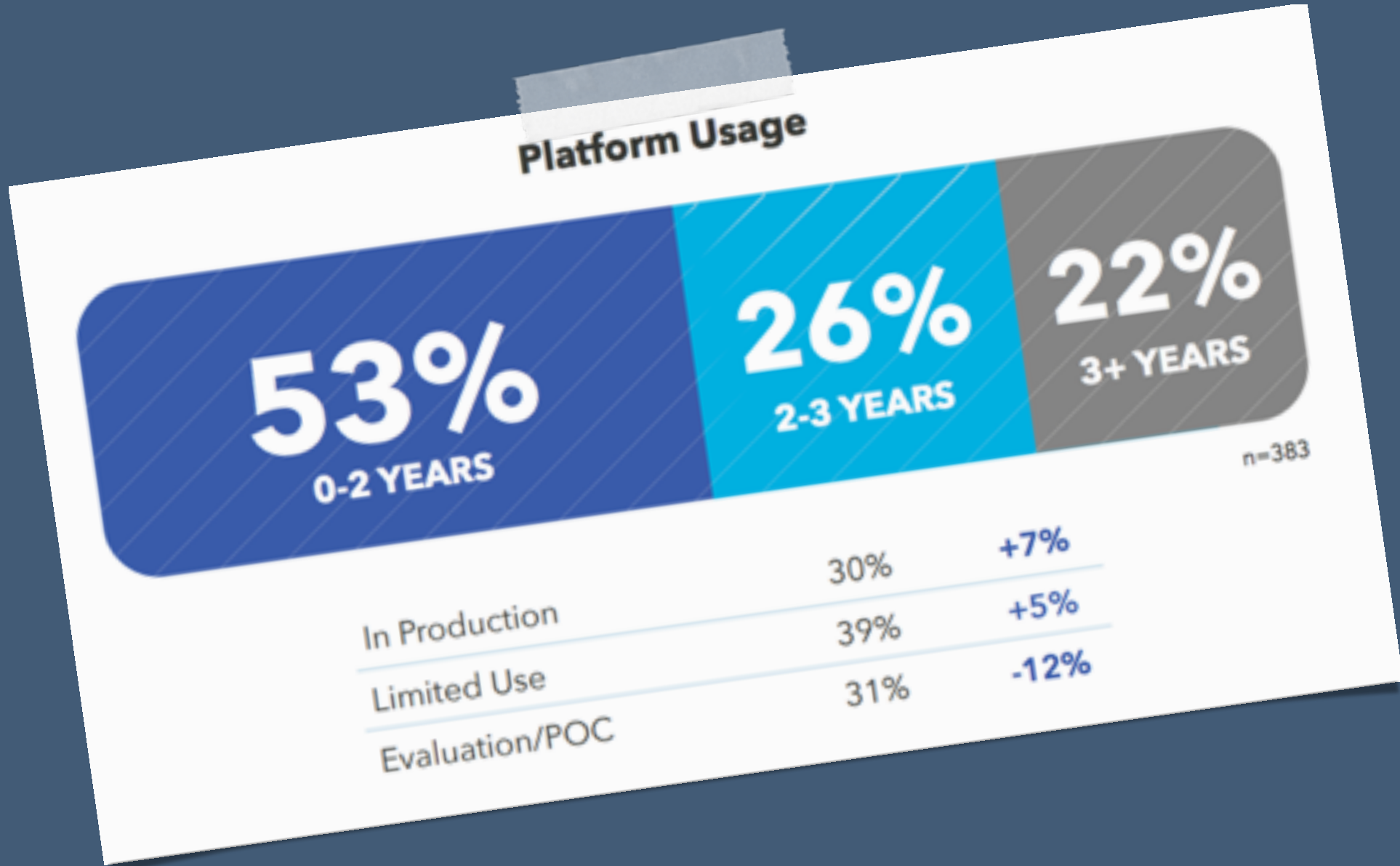
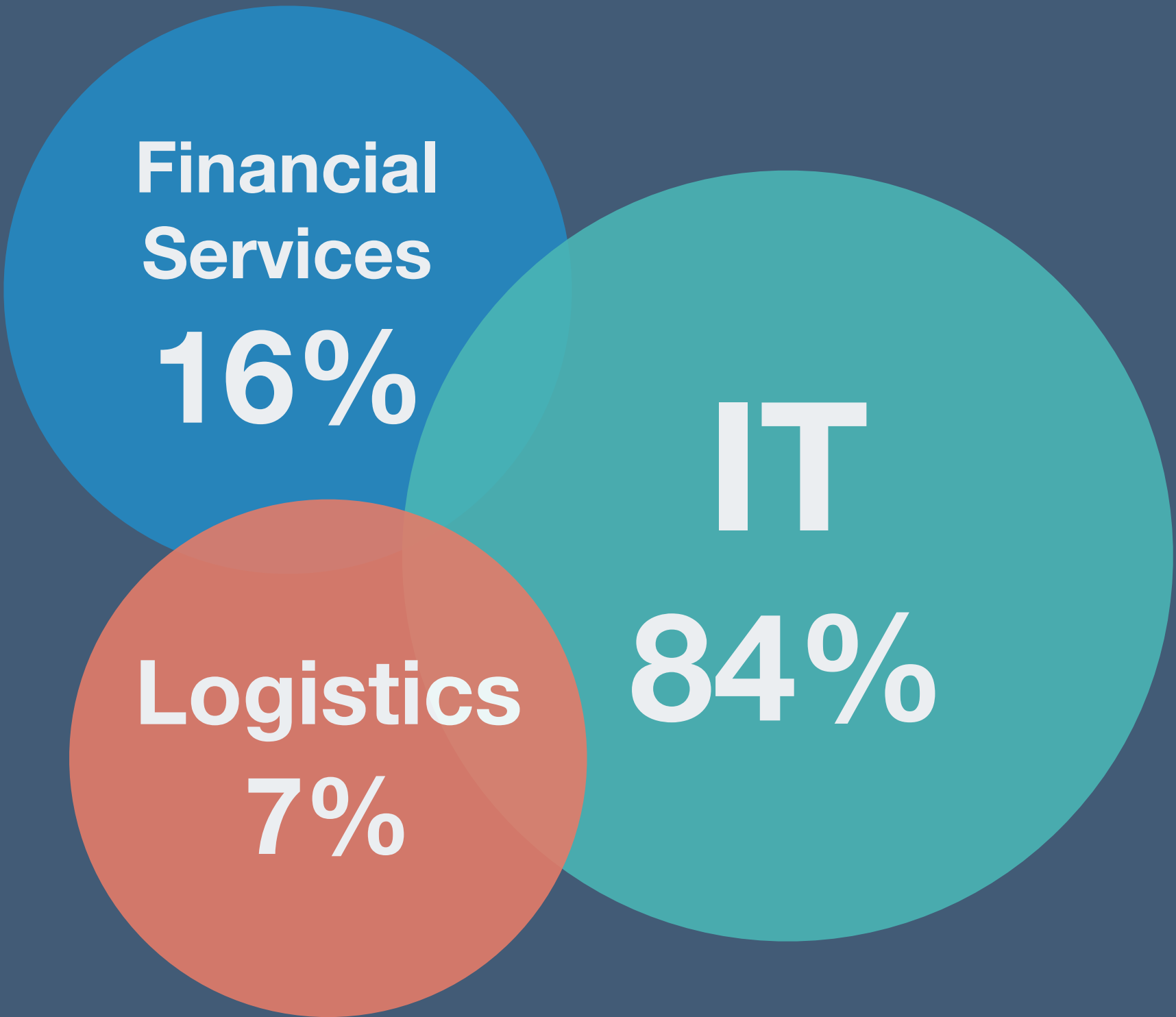
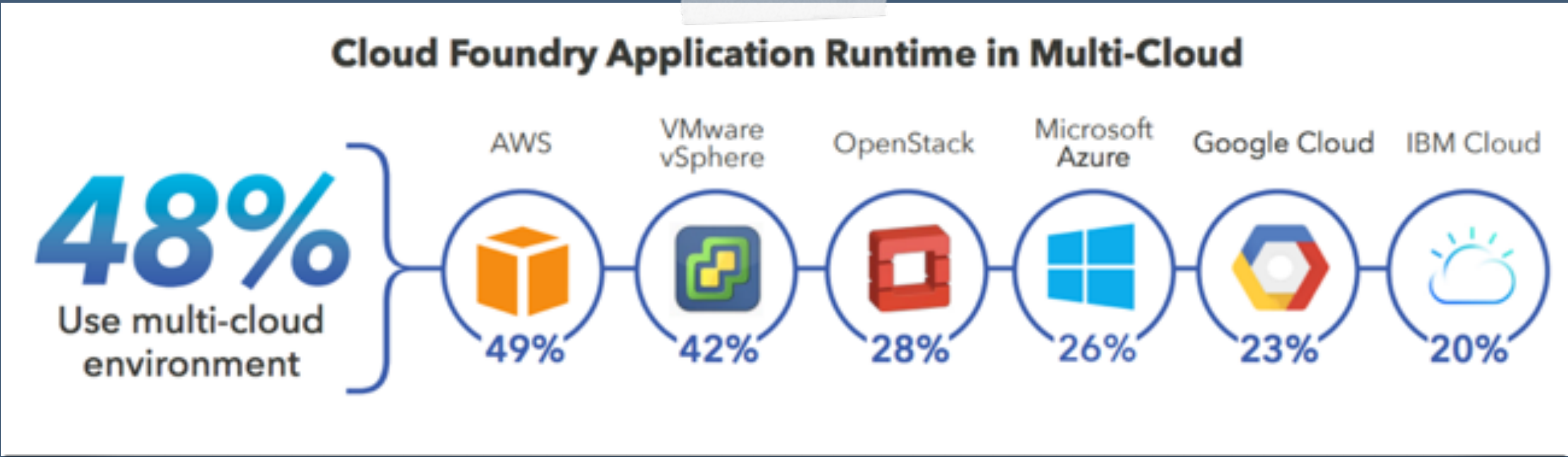


USE CASE BOSCH IOT CLOUD BASED ON CLOUD FOUNDRY



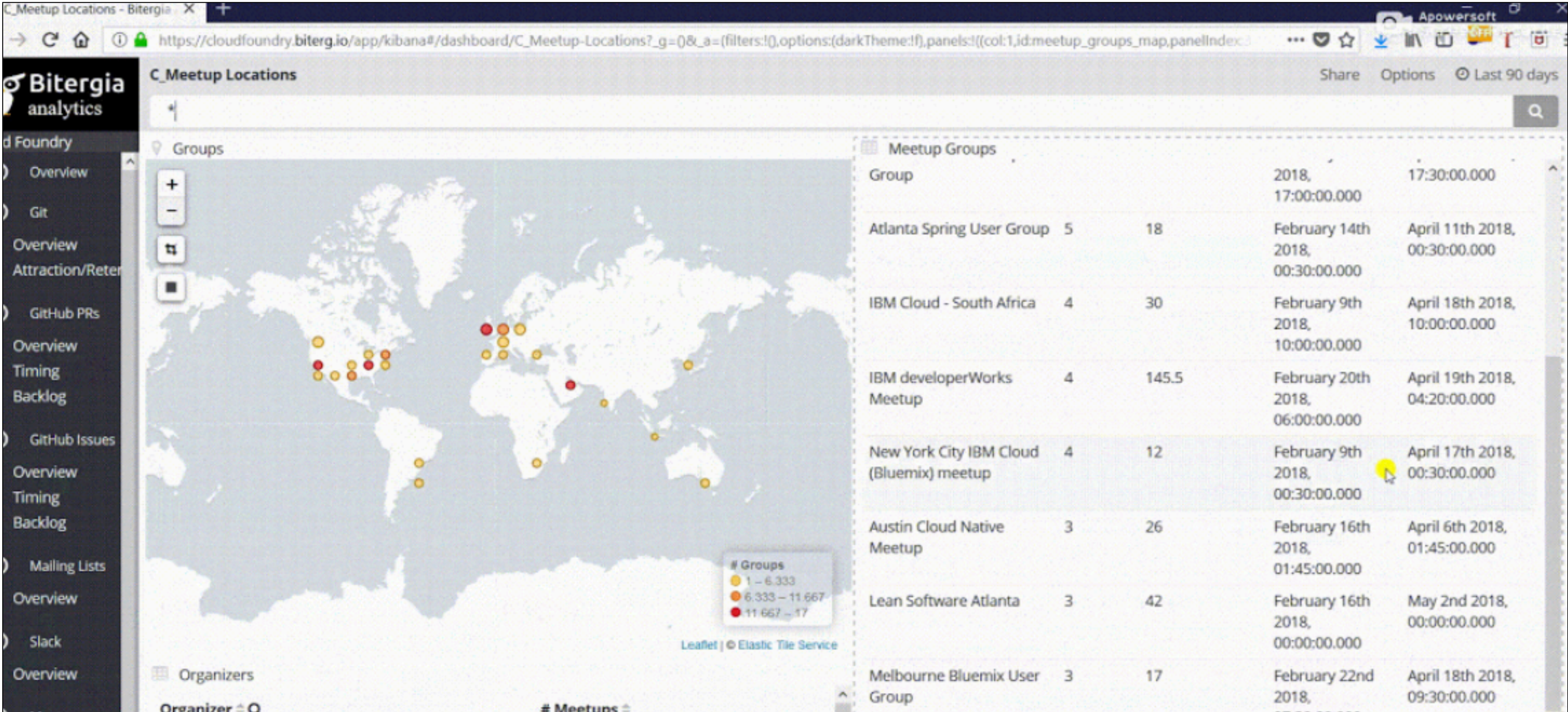
MATURITY ASSESSMENT I

COMMUNITY



MATURITY ASSESSMENT II

COMMUNITY



PRE-DEPLOYMENT

cf login

```
-a <endpoint url>  
-u <username>  
-p <password>
```

cf target

```
-o <org name>  
-s <space name>
```

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

DEPLOYMENT

```
cf push <APP NAME>
```

```
cf push <APP NAME>  
-no -start
```

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

PROVISIONING SERVICES

```
cf marketplace
```

```
cf create-service  
  <SERVICE> <PLAN NAME>  
  <SERVICE INSTANCE NAME>
```

```
cf bind-service <APP NAME>  
  <SERVICE INSTANCE NAME>
```

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

SCALING

```
--Horizontal Scaling  
cf scale <APP NAME> -i <n>  
  
--Vertical Scaling  
cf scale <APP NAME>  
    -k <DISK SPACE LIMIT>  
cf scale <APP NAME>  
    -m <MEMORY LIMIT>
```

Horizontal scaling

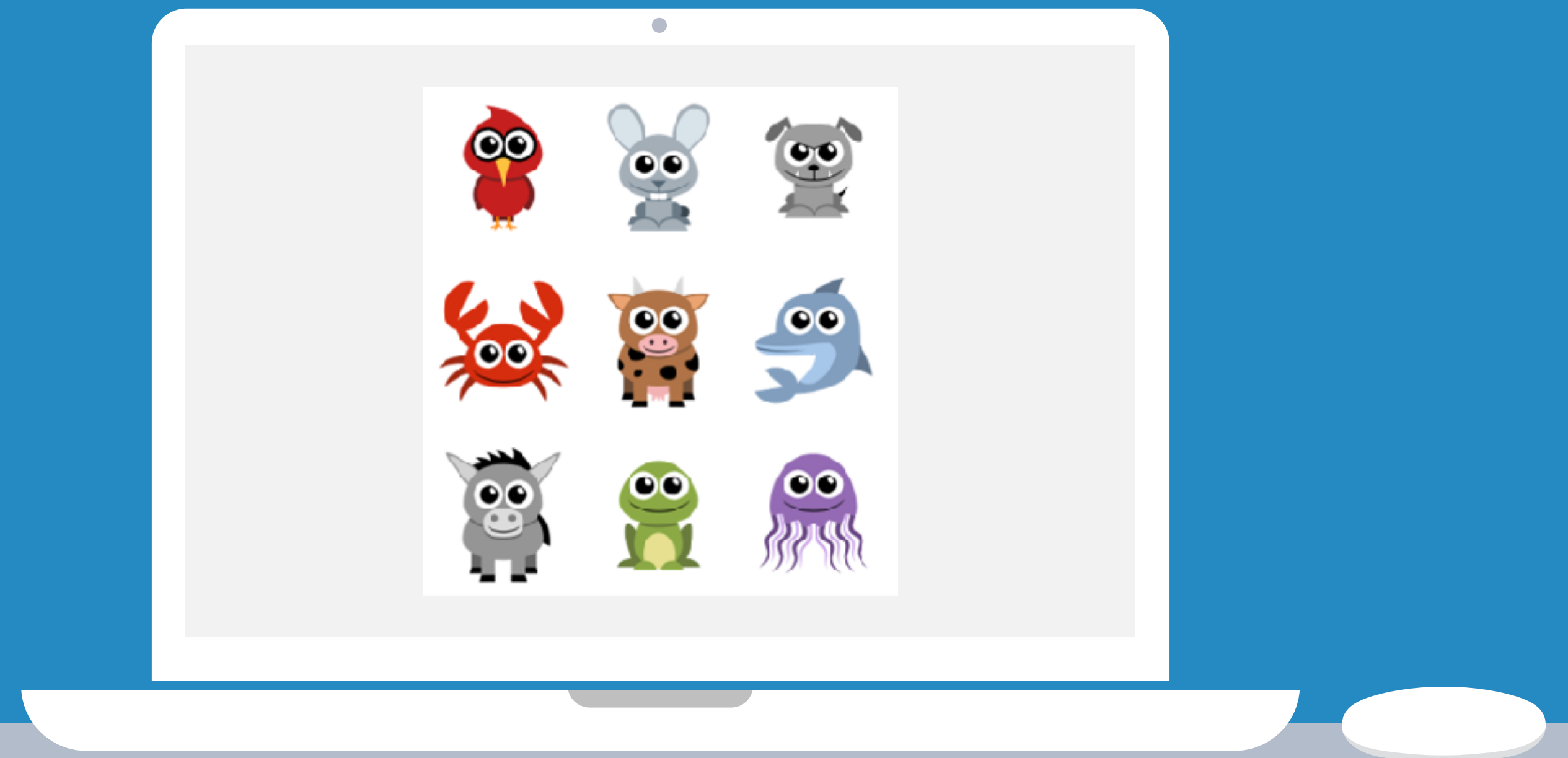
- creates or destroys instances of your application

Vertical scaling

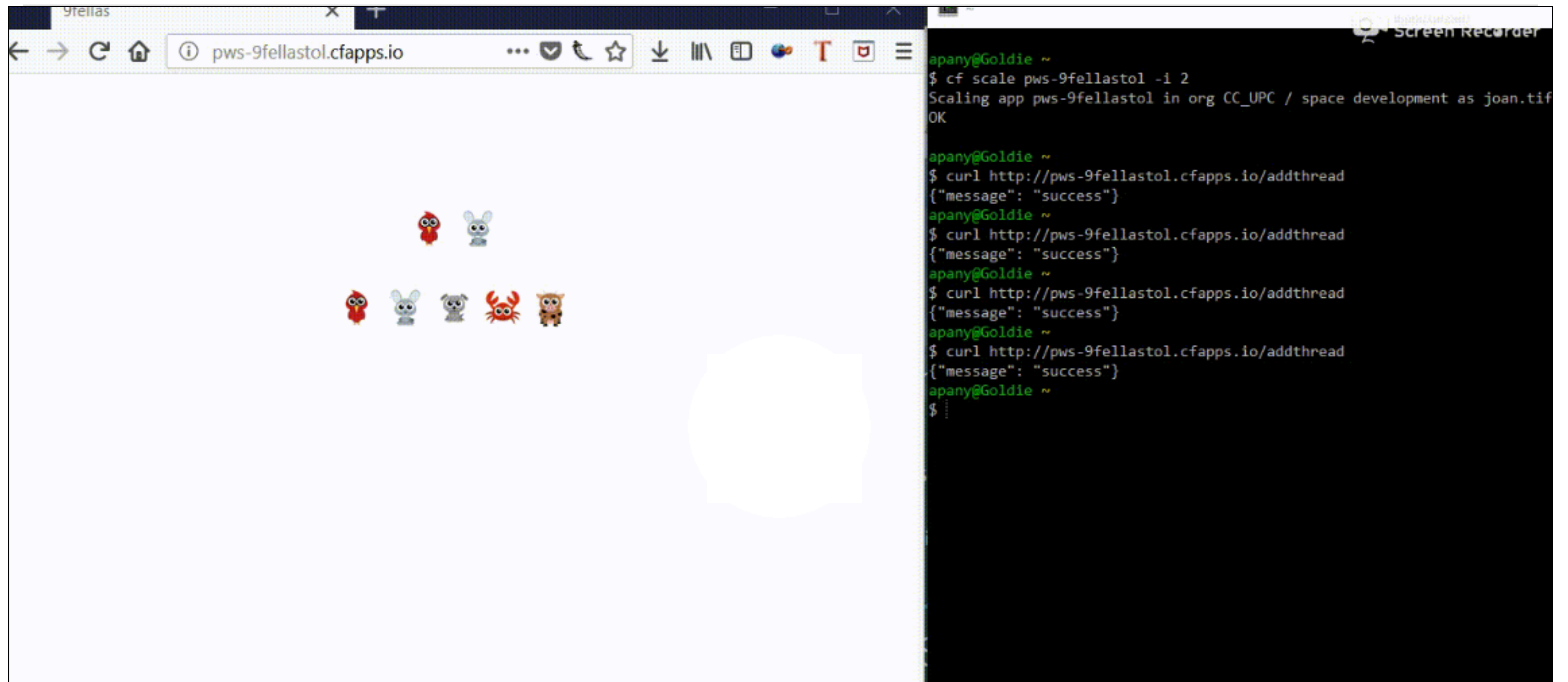
- changes the disk space limit or memory limit that Cloud Foundry applies to all instances of the application
- Specify in M or G

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



The image shows a laptop screen with two windows. The left window is a web browser displaying the URL `pws-9fellastol.cfapps.io`. The page content consists of two rows of animal emojis: the first row has a red parrot and a grey rabbit, and the second row has a red parrot, a grey rabbit, a grey dog, a red crab, and a brown bear. The right window is a terminal with a black background and green text, showing the following commands and output:

```
apany@Goldie ~  
$ cf scale pws-9fellastol -i 2  
Scaling app pws-9fellastol in org CC_UPC / space development as joan.tif  
OK  
  
apany@Goldie ~  
$ curl http://pws-9fellastol.cfapps.io/addthread  
{"message": "success"}  
apany@Goldie ~  
$ curl http://pws-9fellastol.cfapps.io/addthread  
{"message": "success"}  
apany@Goldie ~  
$ curl http://pws-9fellastol.cfapps.io/addthread  
{"message": "success"}  
apany@Goldie ~  
$ curl http://pws-9fellastol.cfapps.io/addthread  
{"message": "success"}  
apany@Goldie ~  
$  
$
```

3-May-2018 Deploy CF toy app

PERSONAL EXPERIENCE

CF setup is resource heavy

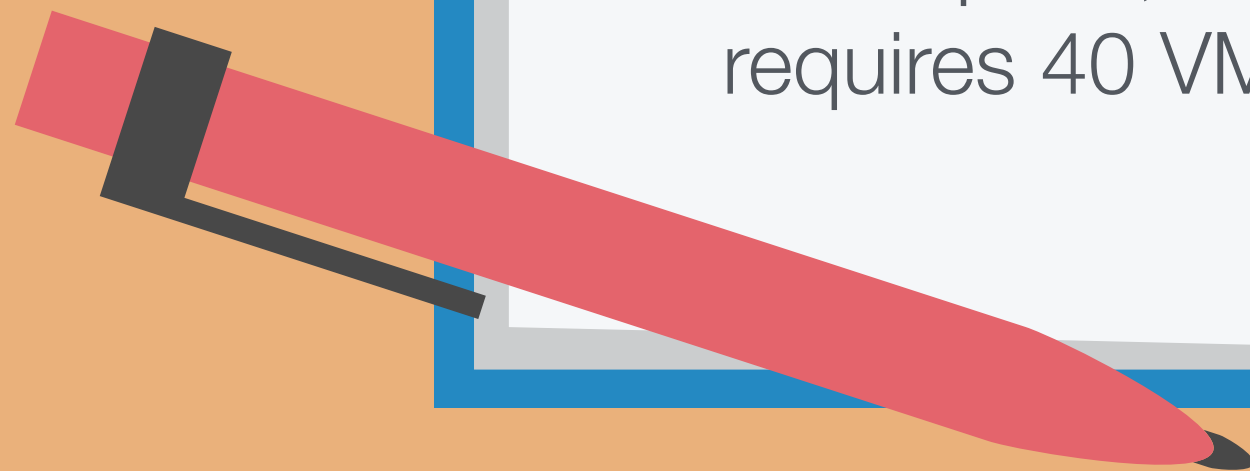
Requires: (AWS)

- 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

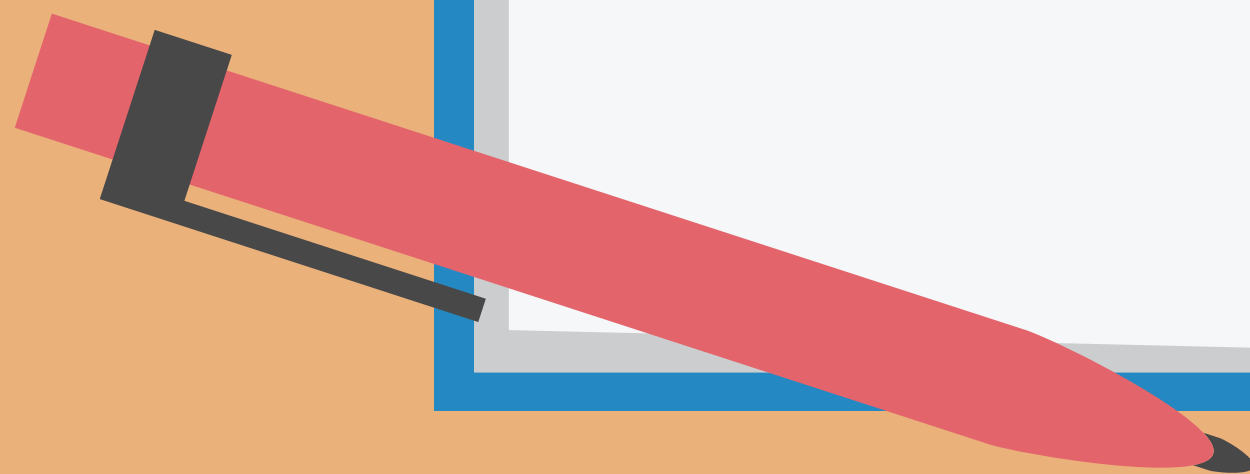
- Even a minimal (open source) CF installation will cost **US\$696.82/month**
- Geared for large enterprises!

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.

