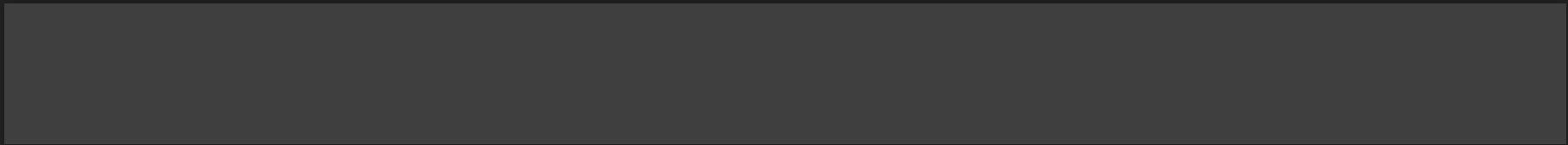


# 01 - DEPLOY

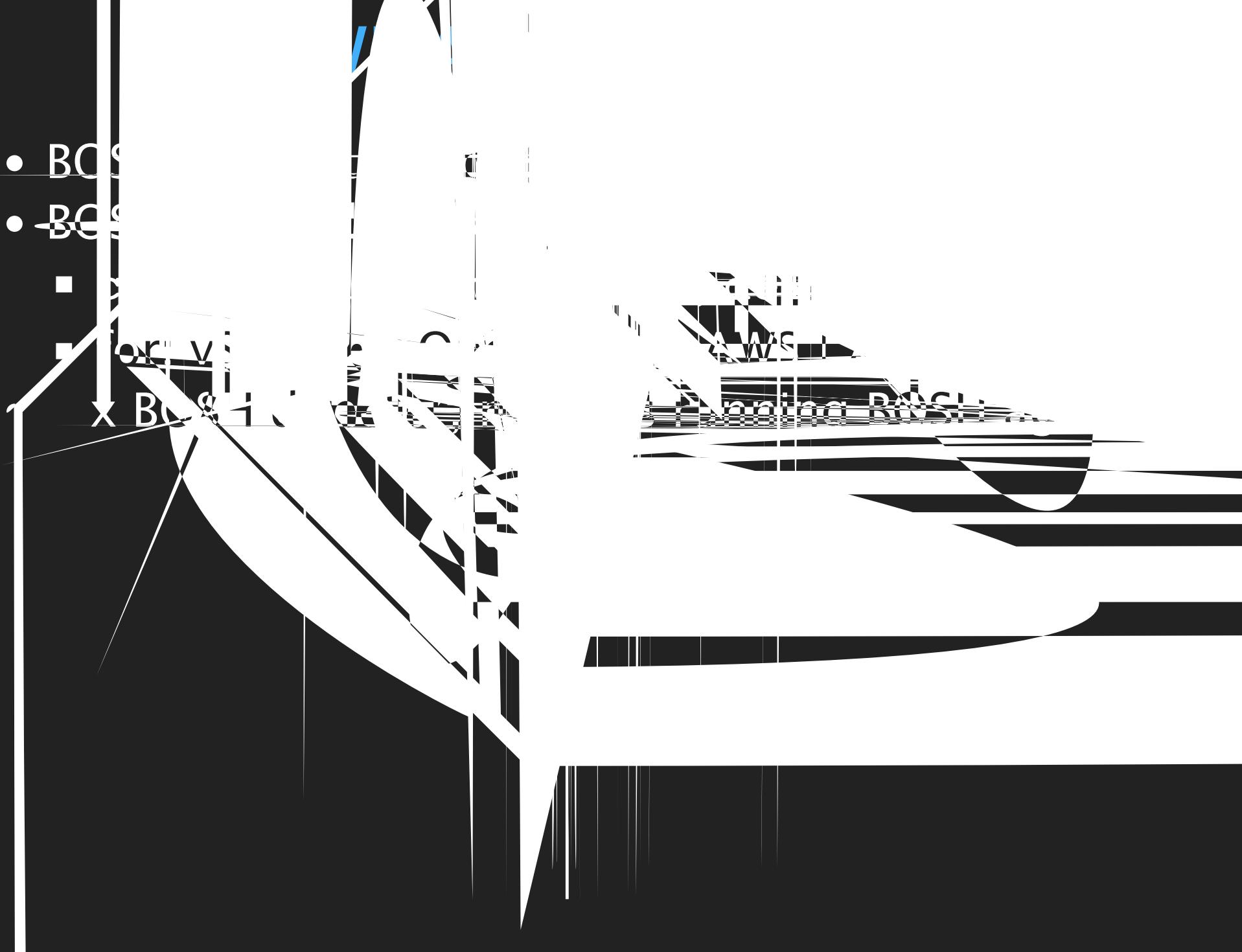


Sir  
cp

:d

# WHAT IS A CLOUD?

- Technical:
  - Virtual infrastructure
    - VMs
    - Networks
    - Disks
  - Driven by an API
- Cultural:
  - Automated, repeatable operations
  - Cattle, not pets



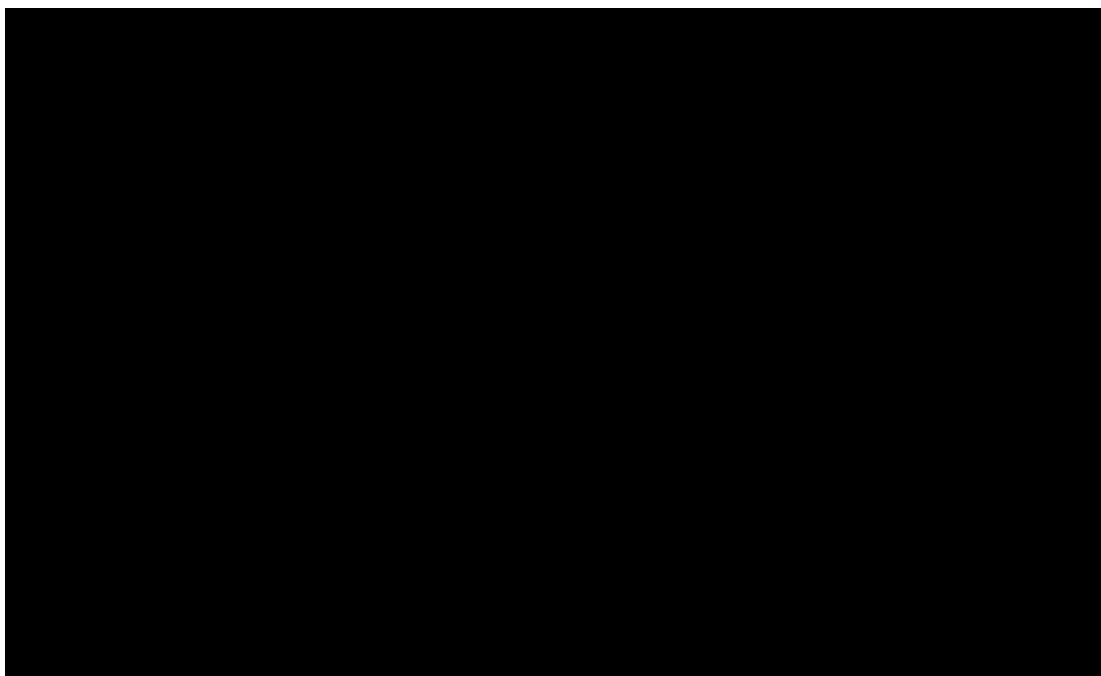
# WHAT IS BOSH-LITE?

- VM with BOSH director installed
- Custom "container" CPI
- Simulate VMs using containers

=> Simulate a cloud on your laptop!

# BOSH PHILOSOPHY

- Works at cluster level
- Self contained
- Optimised for day 2 forward



# CLOUD ON YOUR LAPTOP

- Back to...

```
cd path/to/bosh-lite  
vagrant up
```

- should now see

```
=====  
BOSH-lite cloud ready
```

# DEPLOY CF TO THAT CLOUD

- Deploy CF to that cloud

```
vagrant ssh
```

RO

ON

LOVE+MIL

# BOSH CONCEPTS - STEMCELL

- Download for your cloud type from [bosh.io/stemcells](http://bosh.io/stemcells)
- Minimalist Ubuntu/CentOS + BOSH agent
- Uploaded to BOSH director

```
vagrant ssh #in a new terminal  
bosh stemcells
```

-

# BOSH CONCEPTS - RELEASES

- Download from [bosh.io/releases](http://bosh.io/releases)
- Tarball contains everything to be deployed;
  - runtimes (JVM, Ruby...),
  - services (Redis, CloudController...),
  - config templates
- Uploaded to BOSH director

```
bosh releases
```

- Compiled from \*-boshrelease repos

# BOSH CONCEPTS - MANIFEST

- Cluster configuration
  - stemcell and release(s) versions
  - VM & network specification
  - Jobs – software templates to be installed on each VM
  - config values
- YAML (passed through ERB)

# DEPLOY CF TO THAT CLOUD

- should now see ...

```
=====  
Cloud Foundry deployed!  
=====
```

# BOSH CONCEPTS - DEPLOYMENTS

- Manifest + Release(s) + Stemcell => Deployment

```
bosh deployments
```

- Deployment => BOSH managed VMs running software configured as cluster

```
bosh vms
```

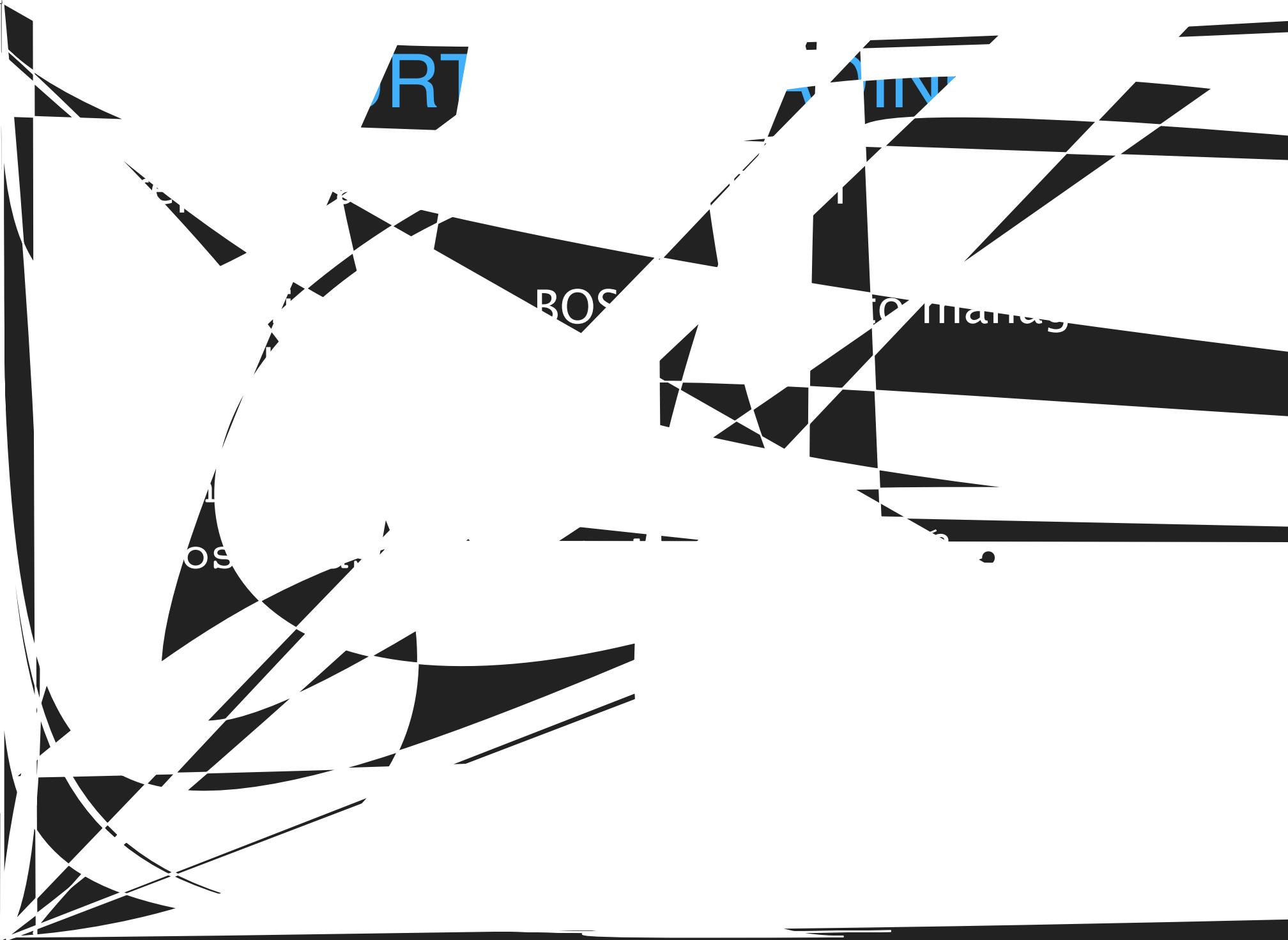
# COMMUNITY

- [www.cloudfoundry.org](http://www.cloudfoundry.org) – participate!
  - Mailing lists – [lists.cloudfoundry.org](mailto:lists.cloudfoundry.org)
  - Repositories – [github.com/cloudfoundry](https://github.com/cloudfoundry),  
[github.com/cloudfoundry-incubator](https://github.com/cloudfoundry-incubator)

# DELIVERED

As a CF operator  
I can





R7

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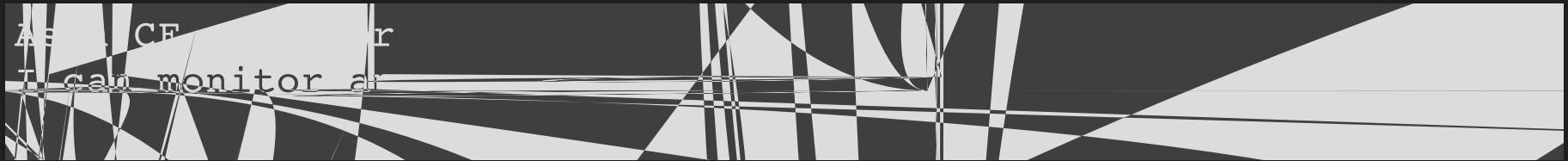
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# 02 - BOSH MONITORING



# WHAT IS A CLOUD

- Container orchestration for microservices
- Routing, scaling, health



BOSSH SSI

ss o doppler /0 (ch temp sud



# MONIT

- Processes are run with Monit

# BOSH HEALTH MONITOR

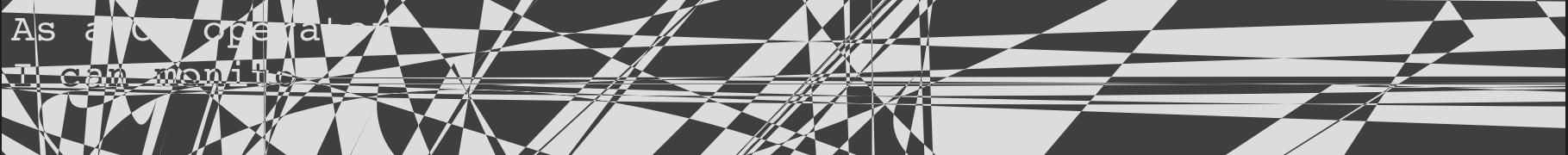
- Original terminal

```
bosh vms
```

-

# DELIVERED

As a cloud operator  
I can monitor



# FURTHER READING

- BOSH Health Monitor plugins
  - BOSH can forward status data to external monitoring systems
  - <http://bosh.io/docs/hm-config.html>

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# 03 - CF-USERS-SPACES-ORGS

As a CF operator

# CF ORGS & SPACES / USERS & PERMISSIONS

- Organisations
  - Quotas
- Spaces
  - Domains
  - Spaces
  - Security Groups
  - Services
  - Apps
- Users
  - Roles

# CF CLI

- CLI for interacting with CF

# CF ORGS

- Create

```
cf create-org platform-ops
```

- List

```
cf orgs
```

- Details

```
cf org platform-ops
```

- Target

```
cf target -o platform-ops
```

# CF SPACES

- Create

```
cf create-space  
cf create-space development
```

- List

```
cf spaces
```

- Details

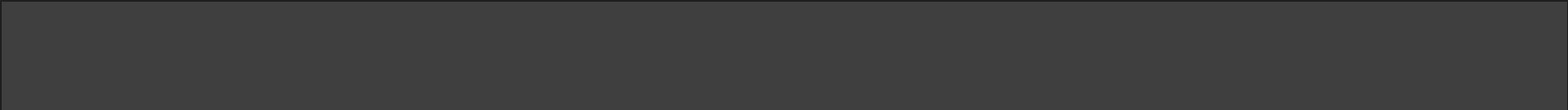
```
cf space development
```

- Target

```
cf target -s development
```

# CF USERS

- Create



# CF APPS

- cf push is golden

```
cd ~/exercises/03-cf-users-spaces-orgs/app  
cf push  
curl -s myapp.10.244.0.34.xip.io
```

- Buildpacks – convert code into runnable droplet.tgz
- List

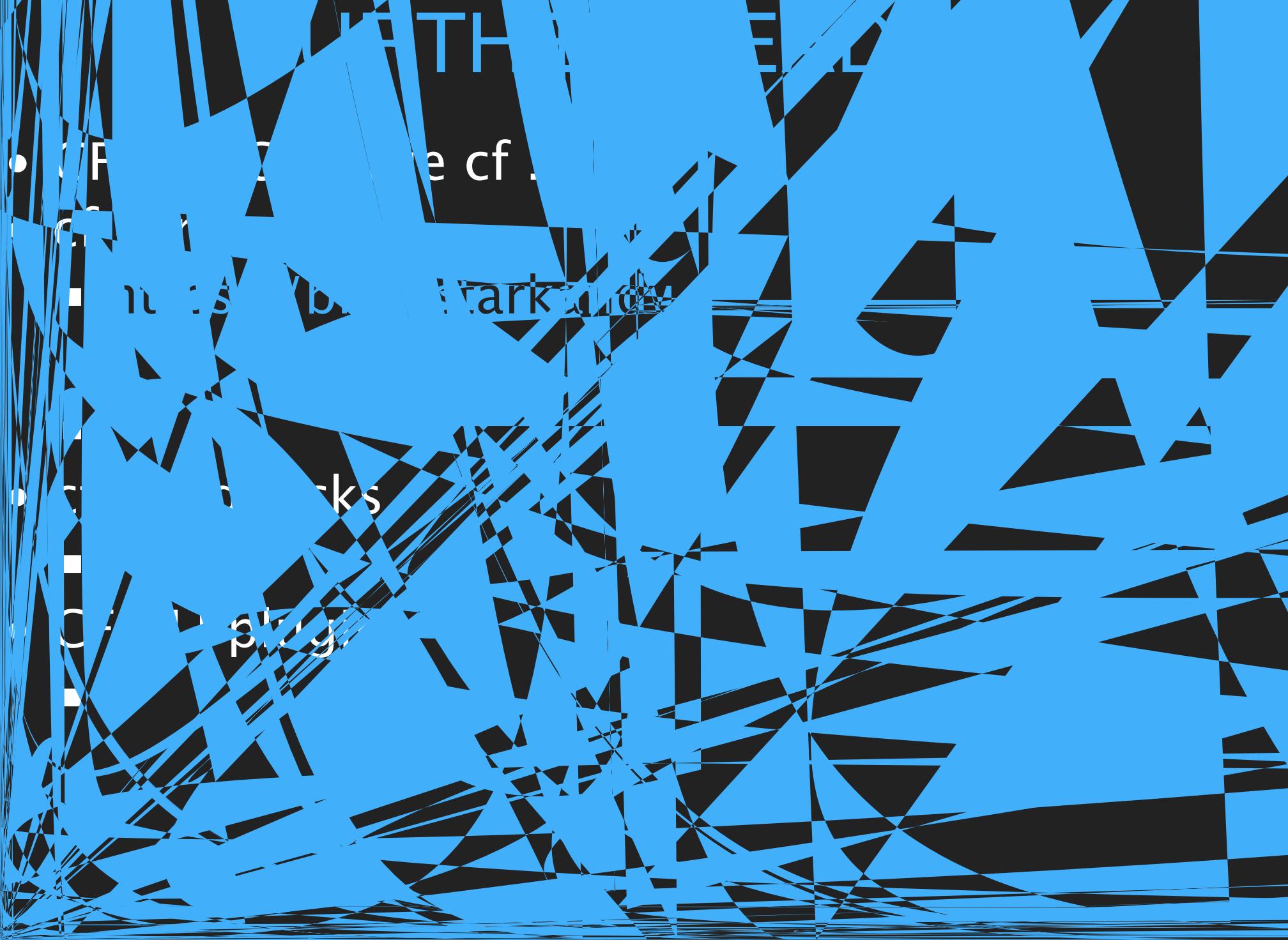
```
cf apps
```

- Details

```
cf app myapp  
cf events myapp  
cf logs myapp --recent
```

# DELIVERED

As a CF operator  
I can provision a new CF user  
So that user can `cf push` their app



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# 04 - DATASERVICE-MARKETPLACE



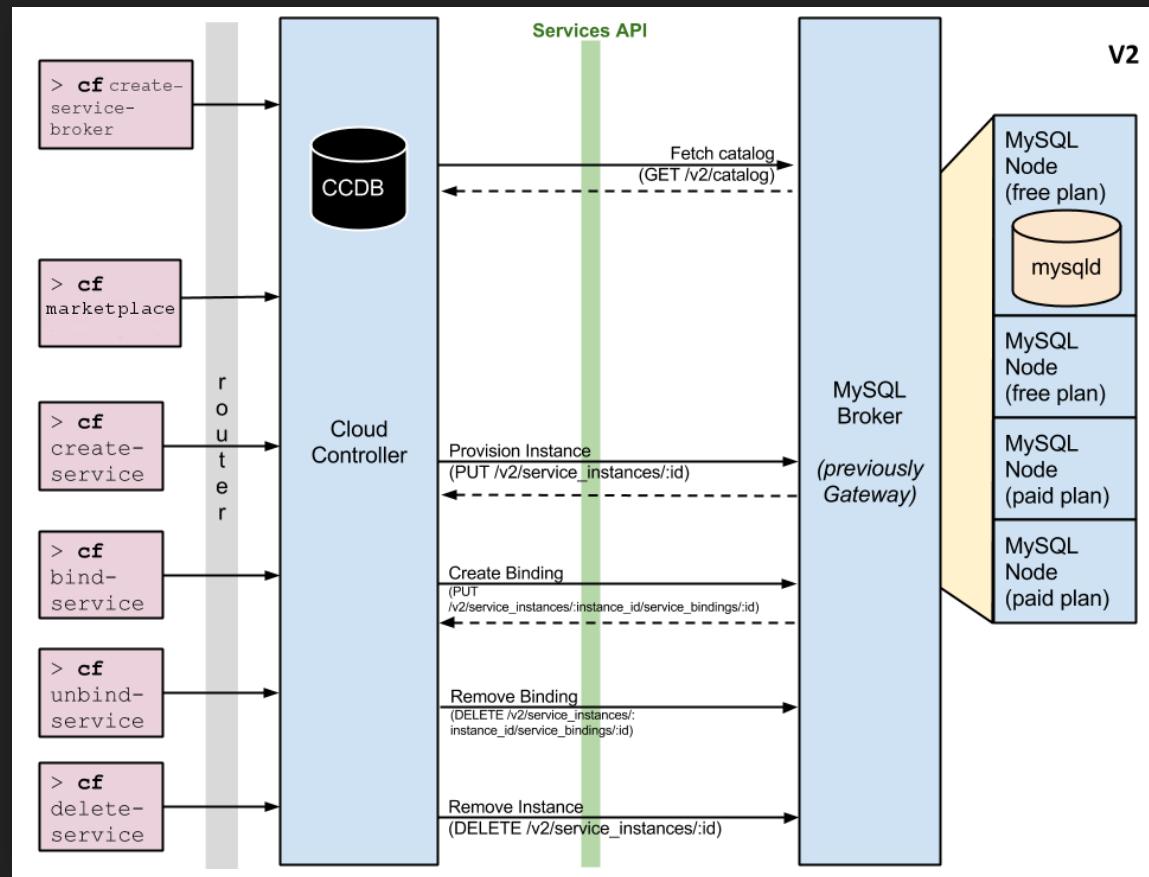
# DATA SERVICE MARKETPLACE

- CF runs stateless apps – where does the data go?
- Many BOSH releases for data services – see [bosh.io](http://bosh.io)

```
cd ~/exercises/04-dataservice-marketplace
bosh upload release cf-redis-release-407.tgz
bosh deployment cf-redis-deployment.yml
bosh -n deploy
```

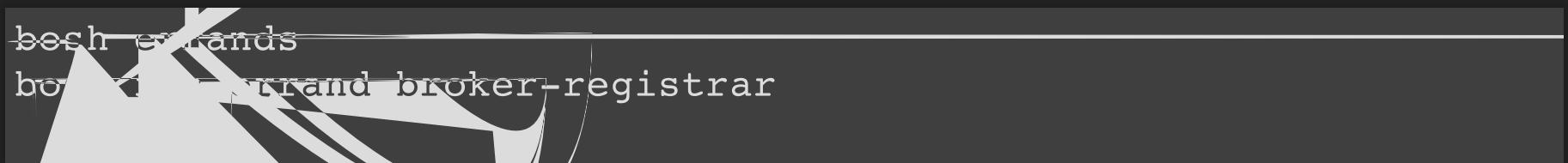
# SERVICE BROKERS

- Register data service with CF runtime
- Provision service
- Provide connection credentials



# BOSH ERRANDS

- BOSH jobs can be long running (default), or run once (errands)
- Many releases encapsulate setup scripts in an errand



# CREATE SERVICE

## Create

```
cf create-service redis shared -v myapp-
```

## Bind

```
cf bind-service myapp -v myapp-
```

# SECURITY GROUPS

- Security Groups restrict outbound network access



# DELIVERED

As a CF operator

# FURTHER

- BOSH deployable components
  - bosh upload/releases
- Manually provisioned data sources

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# 05 - SCALING-CF

As a CF operator  
I can scale CF  
So that more app instances can be deployed

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# MORE RAM, MORE REDUNDANCY

- Scale up larger VMs for FEA
- Scale out

# EDIT THE MANIFEST TO SCALE OUT

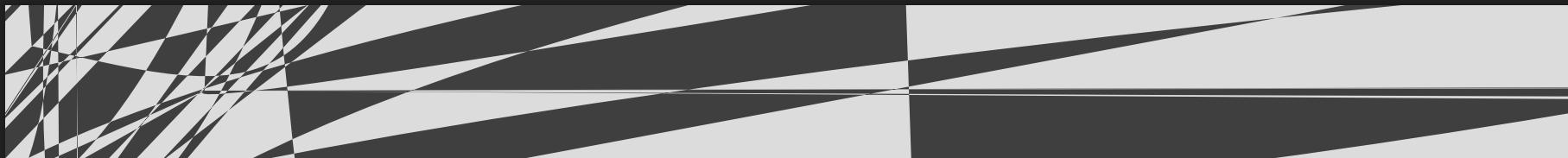
- Get deployed manifest

```
cd ~/exercises/05-scaling-cf  
bosh deployments  
bosh download manifest cf-warden > cf-deployment.yml
```

- Edit cf-deployment.yml, increment instances

```
nano ~/exercises/05-scaling-cf/cf-deployment.yml  
^W runner_z1
```

- Deploy change



# APP INSTANCES DISTRIBUTED OVER DEAS

```
cf scale myapp -i 5  
cf app myapp
```

- CF is distributing app instances across available runners

# SCALE DOWN

- Edit cf-deployment.yml, decrement instances

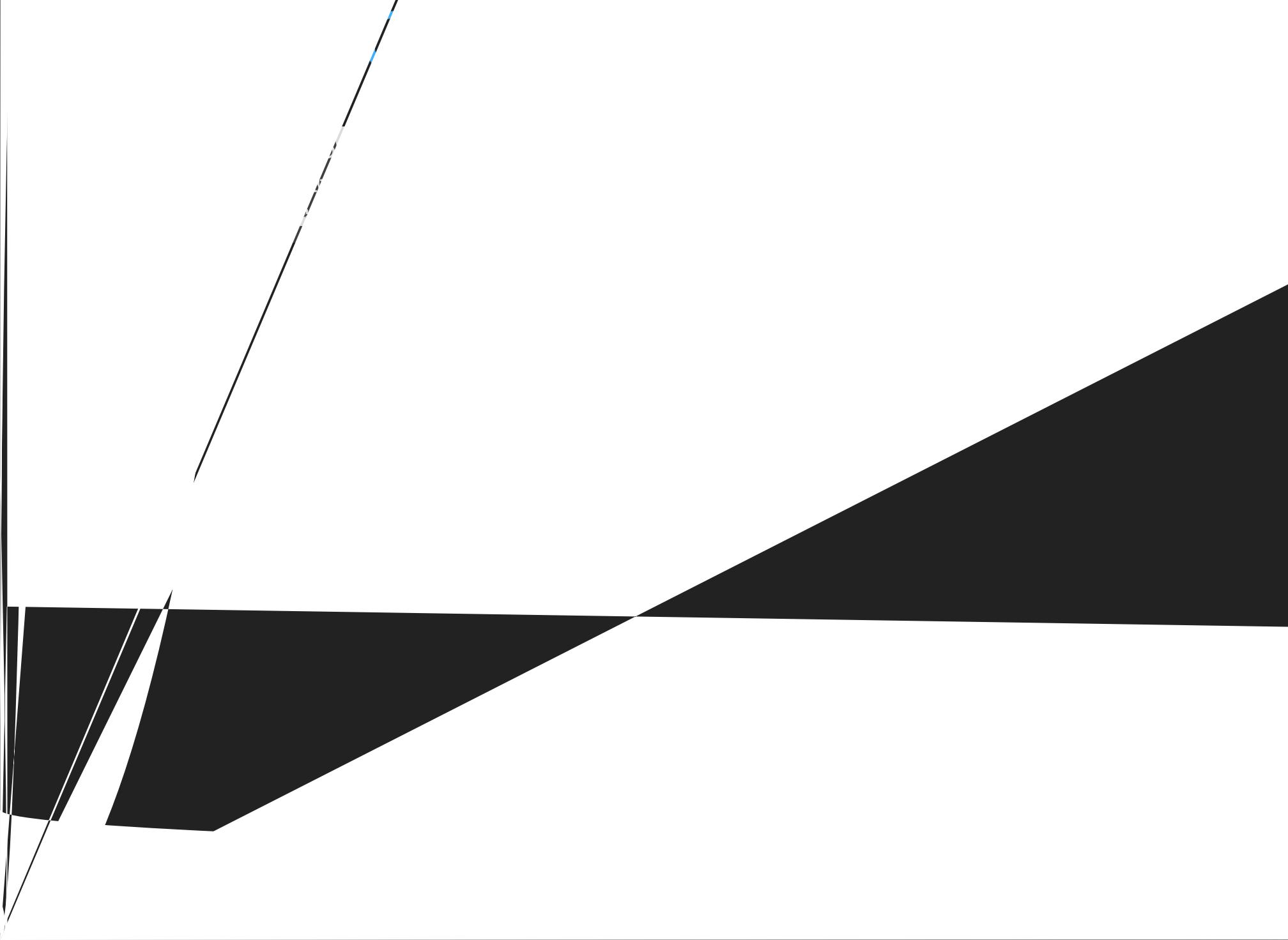
# DELIVERED

As a CF operator  
I can scale CF  
So that more app instances can be deployed

# FURTHER READING

- Canaries & max-in-flight
  - <https://bosh.io/docs/deployment-manifest.html#update>
  - <https://bosh.io/docs/terminology.html#canary>
- Drain scripts
  - <http://bosh.io/docs/drain.html>
- Availability Zones (becoming a feature)
  - <https://github.com/cloudfoundry/bosh-notes/blob/master/availability-zones.md>

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ADING

d day 2 card

You should be upgrading

# WHEN SHOULD YOU UPGRADE?

- Regularly – generally cannot "skip" versions
- Read release notes
  - <https://github.com/cloudfoundry/cf-release/releases/tag/v217>
- Releases are dog-fooded on run.pivotal.io
  - consider waiting 1 week for issues to emerge unless CVE

# UPLOAD THE RELEASE

- For reasons of speed, we'll upgrade redis
- Process is the same for all bosh releases

```
cd ~/exercises/06-upgrade-release/  
bosh upload release cf-redis-release-408.tgz
```

# MANIFEST GENERATION



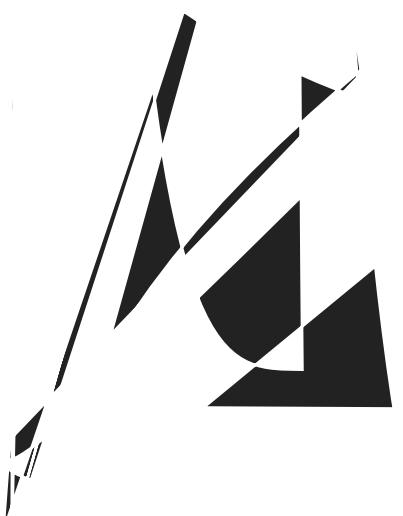


# UPGRADES ARE BORING WITH BOSH!

- weeks of manual work is being automated
- provisioning servers, installing based OS, installing services, updating config, updating inventory
- with zero downtime (with full scale deployment)
- during working hours

SIDE THE

leads



# DELIVERED

As a CF operator  
I can change/upgrade my CF release

R REA

R

-



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# 06 - UPDATING-STEMCELLS

As a CF operator

I can patch my CF cluster's base OS images

So that my users apps aren't vulnerable to security CVEs

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# PRIMING STEM

Conrad  
d / ex se

stemcell  
ting-

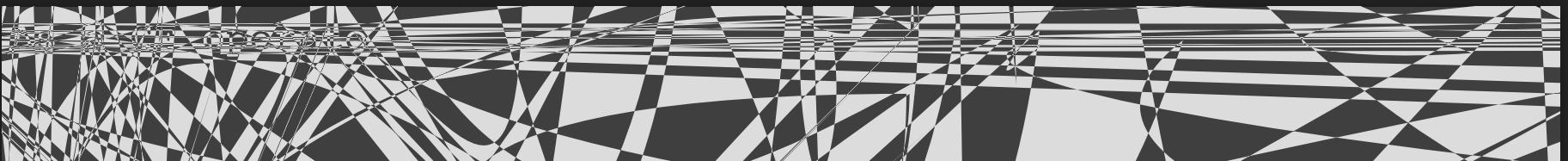
# WHAT'S HAPPENING

- Recompiles packages for/on new stemcell
- Rolls through cluster recreating jobs
- Boring... – wait 20 min

# WHEN TO UPGRADE

- Releases recommend stemcell versions
  - <https://github.com/cloudfoundry/cf-release/releases/tag/v217#recommended-stemcell>
- Base OS security patches – Heartbleed

# DELIVERED



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# 08 - MONITORING (BONUS)

As an advanced CF operator  
I can monitor my CF cluster

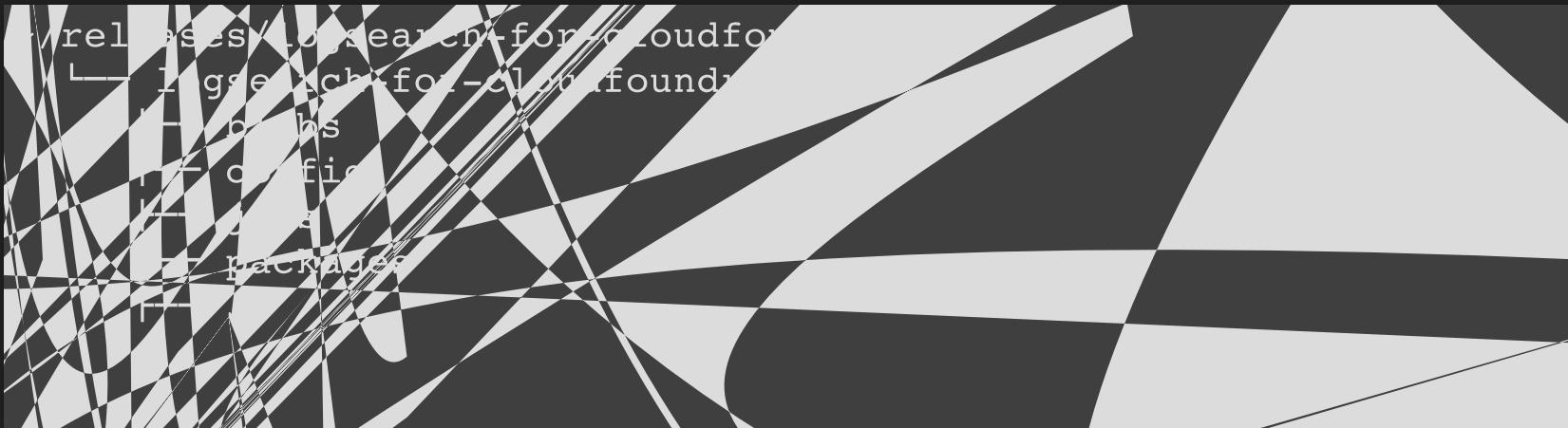
# LOG O RCH-FOR- OUNDRY

- Acts independently
- BOSH-deployed Plastic Flak

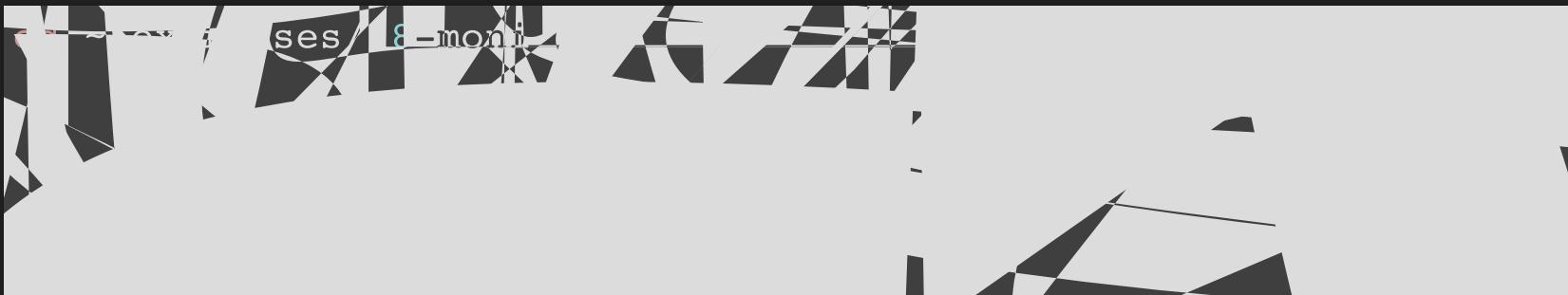
# BUILDING A RELEASE .TGZ

- `release.tgz` built from `bosh-release` git repository

```
~/releases/fetch_releases
```



# DEPLOY LOGSEARCH-FOR-CLOUDFOUNDRY



# ANALYSING PLATFORM METRICS

- <http://logs.10.244.0.34.xip.io>
- <http://docs.pivotal.io/pivotalcf/opsguide/metrics.html>

# DELIVERED

As a CF operator

I can monitor my CF cluster

So that I know about problems before they affect my users



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