Monitoring Cloud Foundry: Learning about the Firehose

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Wednesday May 25, 2016
Welcome to Cloud foundry

Cloud Native Developers
Welcome to Cloud foundry

Cloud Native Developers → Apps
Welcome to Cloud foundry

CI/CD Pipeline

CONTINUOUS DELIVERY PIPELINE (TESTING, BUILD AND RELEASE AUTOMATION)

NON-PROD CLOUD FOUNDARY

PROD CLOUD FOUNDARY
Does it feel more like…. 
Does it feel more like…. Welcome to the Jungle

What's the health of my platform?

How are my apps doing?

How do I get statistics on what’s been happening?
The “Loggregator” to the rescue
How do metrics and logs get to the firehose…
How do metrics and logs get to the firehose…
How do metrics and logs get to the firehose…
How do metrics and logs get to the firehose…
There it is…. the firehose
Make your choice…

Sources
Metron Agents
Dopplers
Traffic Controllers

firehose
Firehose – just a multiplexer
What are the other “logging points”?
What are the other "logging points"?
Firehose - Let’s take a look…. ZERO app activity!
Firehose - Did that feel like…
Firehose - How much was that?

Cloud Foundry bosh-lite 19 “VMs”

60 seconds

????????
Firehose - How much was that?

Cloud Foundry bosh-lite 19 “VMs”

\[\sim 1 \text{mb} / \text{min}\]
How do I consume this firehose?

Cloud Foundry  firehose  ?????
How do I consume this firehose?

Cloud Foundry

firehose

Nozzles
Required for connecting to the firehose

Cloud Foundry bosh-lite

firehose

websocket endpoint

Requires user with firehose.doppler scope
doppler endpoint wss://doppler.bosh-lite.com:4443
Required for connecting to the firehose

Cloud Foundry
bosh-lite

websocket endpoint

Requires user with
firehose.doppler scope

doppler endpoint
wss://doppler.bosh-lite.com:4443

discoverable via api
/v2/info

Nozzles
What now?....events

Cloud Foundry

- Envelopes containing events
- Envelopes come from the traffic controller

Nozzles
What now?....events

Cloud Foundry

firehose

dropsonde

Unmarshall from protocol buffers

Nozzles
What now?....events

Cloud Foundry

firehose

dropsonde

Nozzles

Event types
- HttpStart
- HttpStop
- HttpStartStop
- LogMessage
- ValueMetric
- CounterEvent
- Error
- ContainerMetric

Nozzle lifecycle options

Cloud Foundry

Firehose

Nozzles

bosh deployment

cf app

cf plugin
Nozzle examples

- bosh deployment
  - https://docs.cloudfoundry.org/loggregator/nozzle-tutorial.html

- cf app
  - NOAA nozzle – https://github.com/cloudfoundry/noaa
  - Firehose-to-syslog –
    https://github.com/cloudfoundry-community/firehose-to-syslog

- cf plugin
  - Firehose plugin– https://github.com/cloudfoundry/firehose-plugin
Let’s look at an example message or two…. 

```
cf logs spring-music
```

```
2016-05-25T07:55:41.32-0700 [RTR/0] OUT spring-music-dr.bosh-lite.com - [25/05/2016:14:55:41.051 +0000] "GET /albums HTTP/1.1" 200 0 4669 "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_10_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/50.0.2661.102 Safari/537.36" 10.244.0.34:55356 .0.34" x_forwarded_proto:http vcap_request_id:98eef2e-d220-4882-5702-d82f3fe8ae9e response_time:0.27167381 app_id:caa21664-fd0d-4a4b-87f0-50
```

```
cf nozzle --filter LogMessage
```

```
origin:"gorouter" eventType:LogMessage timestamp:1464188141323666247 deployment:"cf-warden" job:"router_z1" index.com - [25/05/2016:14:55:41.051 +0000] "GET /albums HTTP/1.1" 200 0 4669 "http://spring-music-dr.bosh-lite.com 7.36 (KHTML, like Gecko) Chrome/50.0.2661.102 Safari/537.36" 10.244.0.34:55356 x_forwarded_for:"192.168.50.1, 10.0-4882-5702-d82f3fe8ae9e response_time:0.27167381 app_id:caa21664-fd0d-4a4b-87f0-500b5df8906" message_type:OUT fdf8906" source_type:"RTR" source_instance:"0" >
```
One of these things is not like the other…

cf logs spring-music

```plaintext
```

```plaintext
cf nozzle --filter LogMessage
```

```plaintext
```

ECS TEAM
Here is an app log message...

cf logs spring-music

```
```

cf nozzle --filter LogMessage

```
origin:"rep" eventType:LogMessage timestamp:1464188141130387541 deployment:"cf-warden-diego" job:"call_z1" index:"0" ip:"10.244.16.0" logmessage:message:"14 55:41 controller:29 - *************** I AM AN APP MSG SENT TO STDOUT! " message_type:OUT timestamp:146418814130336650 app_id:"ca21664-fd0d-f8906" source_type:"APP" source_instance:"0" >
```
Here is an app log message…

```
cf logs spring-music
```

```
```

What happens when doing blue-green deploys?

```
cf nozzle --filter LogMessage
```

```
origin:"rep" eventType:LogMessage timestamp:146418814113837541 deployment:"cf-warden-diego" job:"call_z1" index:"0" ip:"10.244.16.10" logmessage:message:"14:55:41 controller:29 - ****************************************** I AM AN APP MSG SENT TO STDOUT! " message_type:OUT timestamp:1464188141138336650 app_id:"ca21664-f0d-5f896" source_type:"APP" source_instance:"0" >
```
Here is an app log message…

cf logs spring-music

What happens when doing blue-green deploys?

cf nozzle --filter LogMessage

Resolved using firehose-to-syslog nozzle
Injects the app name into the nozzle output
A novel use case – feedback control loops
Feedback control demo – Memory based auto-scaling

Cloud Foundry bosh-lite

memory-based-autoscaler nozzle (cf app)
Feedback control demo – Memory based auto-scaling

memory-based-autoscaler nozzle (cf app)
Feedback control demo – Memory based auto-scaling

Cloud Foundry bosh-lite

memory-based-autoscaler nozzle (cf app)

Input → + → A → R → Output

Average memory for all instances exceeds a threshold for specified duration
Feedback control demo – Memory based auto-scaling

memory-based-autoscaler nozzle (cf app)

Cloud Foundry bosh-lite

Input → + → A → Output

firehose

cf scale using the cf API
Demo
Where can I get “the code”?

Memory auto-scaler
https://github.com/ECSTeam/memory-based-autoscaler

Memory user
https://github.com/ECSTeam/memory-user
For more information....

• Come by the ECS Team booth – we’ll talk firehose madness

• Register to win
  • Amazon Echo
  • Garmin Vivosmart

• Drawing to win – 3:20pm today (5/25/2016)