

Centralized Logging Patterns

Philipp Krenn
@xeraa
Elastic


```
java-logging — fish /Users/philipp/Documents/GitHub/java-logging — -fish — 105x26
[philipp@~/Documents/GitHub/java-logging(git*master)X> gradle run 14:47:14]

> Task :run
[2018-05-31 14:47:22.185] TRACE net.xeraa.logging.LogMe [main] - session=29, loop=1 - Iteration '1' and session '29'
[2018-05-31 14:47:22.196] DEBUG net.xeraa.logging.LogMe [main] - session=29, loop=1 - Collect in development
[2018-05-31 14:47:22.200] TRACE net.xeraa.logging.LogMe [main] - session=49, loop=2 - Iteration '2' and session '49'
[2018-05-31 14:47:22.201] DEBUG net.xeraa.logging.LogMe [main] - session=49, loop=2 - Collect in development
[2018-05-31 14:47:22.202] TRACE net.xeraa.logging.LogMe [main] - session=85, loop=3 - Iteration '3' and session '85'
[2018-05-31 14:47:22.203] INFO net.xeraa.logging.LogMe [main] - session=85, loop=3 - Collect in production
[2018-05-31 14:47:22.204] TRACE net.xeraa.logging.LogMe [main] - session=55, loop=4 - Iteration '4' and session '55'
[2018-05-31 14:47:22.204] DEBUG net.xeraa.logging.LogMe [main] - session=55, loop=4 - Collect in development
[2018-05-31 14:47:22.205] TRACE net.xeraa.logging.LogMe [main] - session=83, loop=5 - Iteration '5' and session '83'
[2018-05-31 14:47:22.205] WARN net.xeraa.logging.LogMe [main] - session=83, loop=5 - Investigate tomorrow
[2018-05-31 14:47:22.206] TRACE net.xeraa.logging.LogMe [main] - session=36, loop=6 - Iteration '6' and session '36'
[2018-05-31 14:47:22.206] INFO net.xeraa.logging.LogMe [main] - session=36, loop=6 - Collect in producti
```

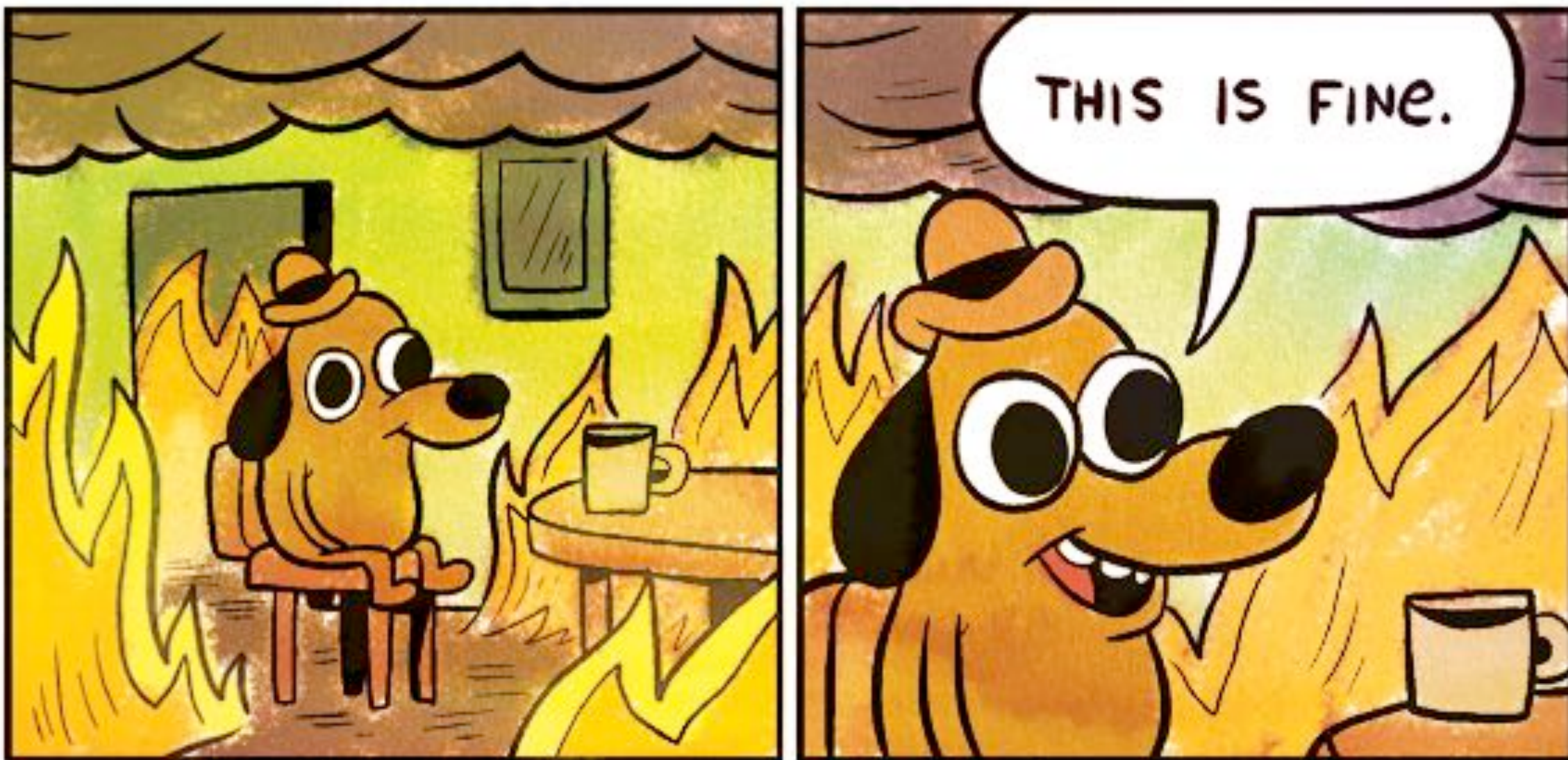


```
java-logging — fish /Users/philipp/Documents/GitHub/java-logging — -fish — 105x26
[philipp@~/Documents/GitHub/java-logging(git*master)✓] cat logs/java-logging.log 14:47:23
[2018-05-31 14:42:58.951] TRACE net.xeraa.logging.LogMe [main] - session=46, loop=1 - Iteration '1' and session '46'
[2018-05-31 14:42:58.961] DEBUG net.xeraa.logging.LogMe [main] - session=46, loop=1 - Collect in development
[2018-05-31 14:42:58.963] TRACE net.xeraa.logging.LogMe [main] - session=13, loop=2 - Iteration '2' and session '13'
[2018-05-31 14:42:58.963] DEBUG net.xeraa.logging.LogMe [main] - session=13, loop=2 - Collect in development
[2018-05-31 14:42:58.964] TRACE net.xeraa.logging.LogMe [main] - session=70, loop=3 - Iteration '3' and session '70'
[2018-05-31 14:42:58.964] INFO net.xeraa.logging.LogMe [main] - session=70, loop=3 - Collect in production
[2018-05-31 14:42:58.965] TRACE net.xeraa.logging.LogMe [main] - session=68, loop=4 - Iteration '4' and session '68'
[2018-05-31 14:42:58.966] DEBUG net.xeraa.logging.LogMe [main] - session=68, loop=4 - Collect in development
[2018-05-31 14:42:58.966] TRACE net.xeraa.logging.LogMe [main] - session=84, loop=5 - Iteration '5' and session '84'
[2018-05-31 14:42:58.966] WARN net.xeraa.logging.LogMe [main] - session=84, loop=5 - Investigate tomorrow
[2018-05-31 14:42:58.967] TRACE net.xeraa.logging.LogMe [main] - session=82, loop=6 - Iteration '6' and session '82'
[2018-05-31 14:42:58.969] INFO net.xeraa.logging.LogMe [main] - session=82, loop=6 - Collect in production
[2018-05-31 14:42:58.969] TRACE net.xeraa.logging.LogMe [main] - session=7, loop=7 - Iteration '7' and se
```



```
java-logging — tail /Users/philipp/Documents/GitHub/java-logging — tail -f logs/java-loggi...
[philipp@~/Documents/GitHub/java-logging(git*master)➤ tail -f logs/java-logging.log 18:39:45]
[2018-05-31 17:20:22.874] TRACE net.xeraa.logging.LogMe [main] - session=61, loop=16 - Iteration '16' and
session '61'
[2018-05-31 17:20:22.874] DEBUG net.xeraa.logging.LogMe [main] - session=61, loop=16 - Collect in develop
ment
[2018-05-31 17:20:22.881] TRACE net.xeraa.logging.LogMe [main] - session=2, loop=17 - Iteration '17' and
session '2'
[2018-05-31 17:20:22.882] DEBUG net.xeraa.logging.LogMe [main] - session=2, loop=17 - Collect in developm
ent
[2018-05-31 17:20:22.883] TRACE net.xeraa.logging.LogMe [main] - session=35, loop=18 - Iteration '18' and
session '35'
[2018-05-31 17:20:22.884] INFO net.xeraa.logging.LogMe [main] - session=35, loop=18 - Collect in product
ion
[2018-05-31 17:20:22.886] TRACE net.xeraa.logging.LogMe [main] - session=86, loop=19 - Iteration '19' and
session '86'
[2018-05-31 17:20:22.889] DEBUG net.xeraa.logging.LogMe [main] - session=86, loop=19 - Collect in develop
ment
[2018-05-31 17:20:22.890] TRACE net.xeraa.logging.LogMe [main] - session=92, loop=20 - Iteration '20' and
session '92'
[2018-05-31 17:20:22.891] WARN net.xeraa.logging.LogMe [main] - session=92, loop=20 - Investigate tomorr
OW
[2018-05-31 18:40:05.399] TRACE net.xeraa.logging.LogMe [main] - session=40, loop=1 - Iteration '1' and s
ession '40'
[2018-05-31 18:40:05.417] DEBUG net.xeraa.logging.LogMe [main] - session=40, loop=1 - Collect in developm
ent
[2018-05-31 18:40:05.420] TRACE net.xeraa.logging.LogMe [main] - session=51, loop=2 - Iteration '2' and s
```

```
java-logging — fish /Users/philipp/Documents/GitHub/java-logging — -fish — 105x26
philipp@~/Documents/GitHub/java-logging(git*master)➤ less +F logs/java-logging.log 18:42:08
```


```
java-logging — fish /Users/philipp/Documents/GitHub/java-logging — -fish — 105x12

[cat logs/java-logging.log]
[2018-05-31 14:42:58.951] TRACE net.xeraa.logging.LogMe [main] - session=46, loop=1 - Iteration '1' and session '46'
[2018-05-31 14:42:58.961] DEBUG net.xeraa.logging.LogMe [main] - session=46, loop=1 - Collect in development
[2018-05-31 14:42:58.963] TRACE net.xeraa.logging.LogMe [main] - session=13, loop=2 - Iteration '2' and session '13'

[cat logs/java-logging.log]
[2018-05-31 14:42:58.951] TRACE net.xeraa.logging.LogMe [main] - session=46, loop=1 - Iteration '1' and session '46'
[2018-05-31 14:42:58.961] DEBUG net.xeraa.logging.LogMe [main] - session=46, loop=1 - Collect in development
[2018-05-31 14:42:58.963] TRACE net.xeraa.logging.LogMe [main] - session=13, loop=2 - Iteration '2' and session '13'

[cat logs/java-logging.log]
[2018-05-31 14:42:58.951] TRACE net.xeraa.logging.LogMe [main] - session=46, loop=1 - Iteration '1' and session '46'
[2018-05-31 14:42:58.961] DEBUG net.xeraa.logging.LogMe [main] - session=46, loop=1 - Collect in development
[2018-05-31 14:42:58.963] TRACE net.xeraa.logging.LogMe [main] - session=13, loop=2 - Iteration '2' and session '13'
[2018-05-31 14:42:58.963] DEBUG net.xeraa.logging.LogMe [main] - session=13, loop=2 - Collect in development
[2018-05-31 14:42:58.964] TRACE net.xeraa.logging.LogMe [main] - session=70, loop=3 - Iteration '3' and session '70'
[2018-05-31 14:42:58.964] INFO net.xeraa.logging.LogMe [main] - session=70, loop=3 - Collect in production
```

```
java-logging — fish /Users/philipp/Documents/GitHub/java-logging — -fish — 105x1
[cat logs/java-logging.log]
[2018-05-31 14:42:58.951] TRACE net.xeraa.logging.LogMe [main] - session=46, loop=1 - Iteration '1' and s

[cat logs/java-logging.log]
[2018-05-31 14:42:58.951] TRACE net.xeraa.logging.LogMe [main] - session=46, loop=1 - Iteration '1' and s

[cat logs/java-logging.log]
[2018-05-31 14:42:58.951] TRACE net.xeraa.logging.LogMe [main] - session=46, loop=1 - Iteration '1' and s

[cat logs/java-logging.log]
[2018-05-31 14:42:58.951] TRACE net.xeraa.logging.LogMe [main] - session=46, loop=1 - Iteration '1' and s

[cat logs/java-logging.log]
[2018-05-31 14:42:58.951] TRACE net.xeraa.logging.LogMe [main] - session=46, loop=1 - Iteration '1' and s

[2018-05-31 14:42:58.951] TRACE net.xeraa.logging.LogMe [main] - session=46, loop=1 - Iteration '1' and s
session '46'

[cat logs/java-logging.log]
[2018-05-31 14:42:58.951] TRACE net.xeraa.logging.LogMe [main] - session=46, loop=1 - Iteration '1' and s

[cat logs/java-logging.log]
```



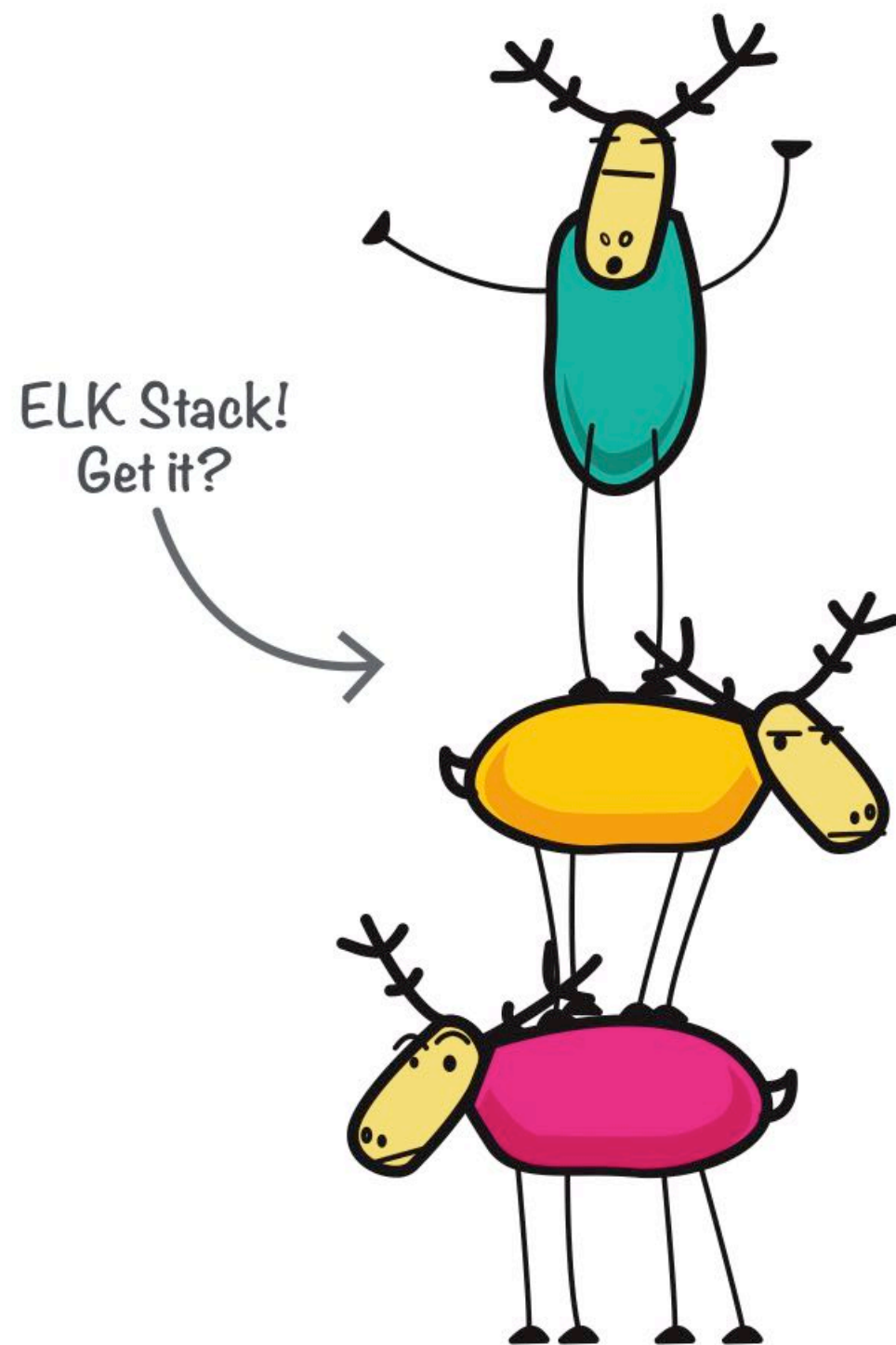

ALL THE THINGS!





elastic

Developer 🥑



E Elasticsearch

L Logstash

K Kibana

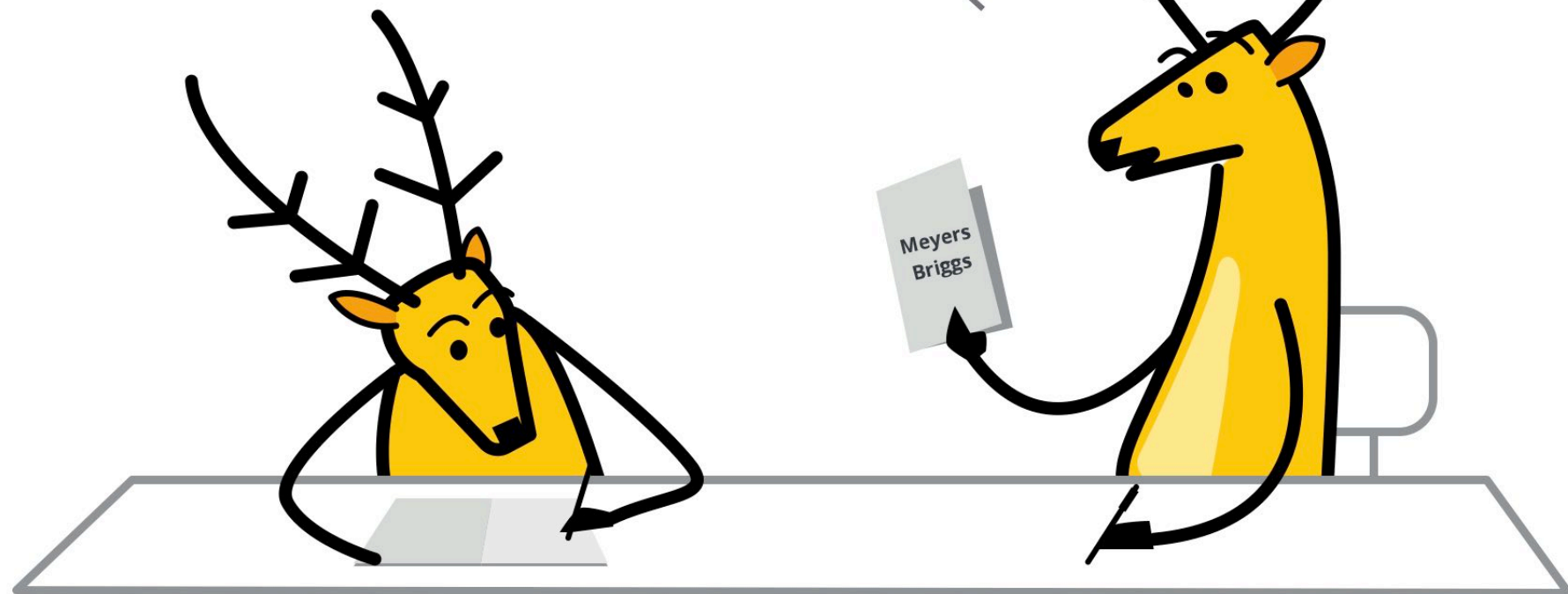


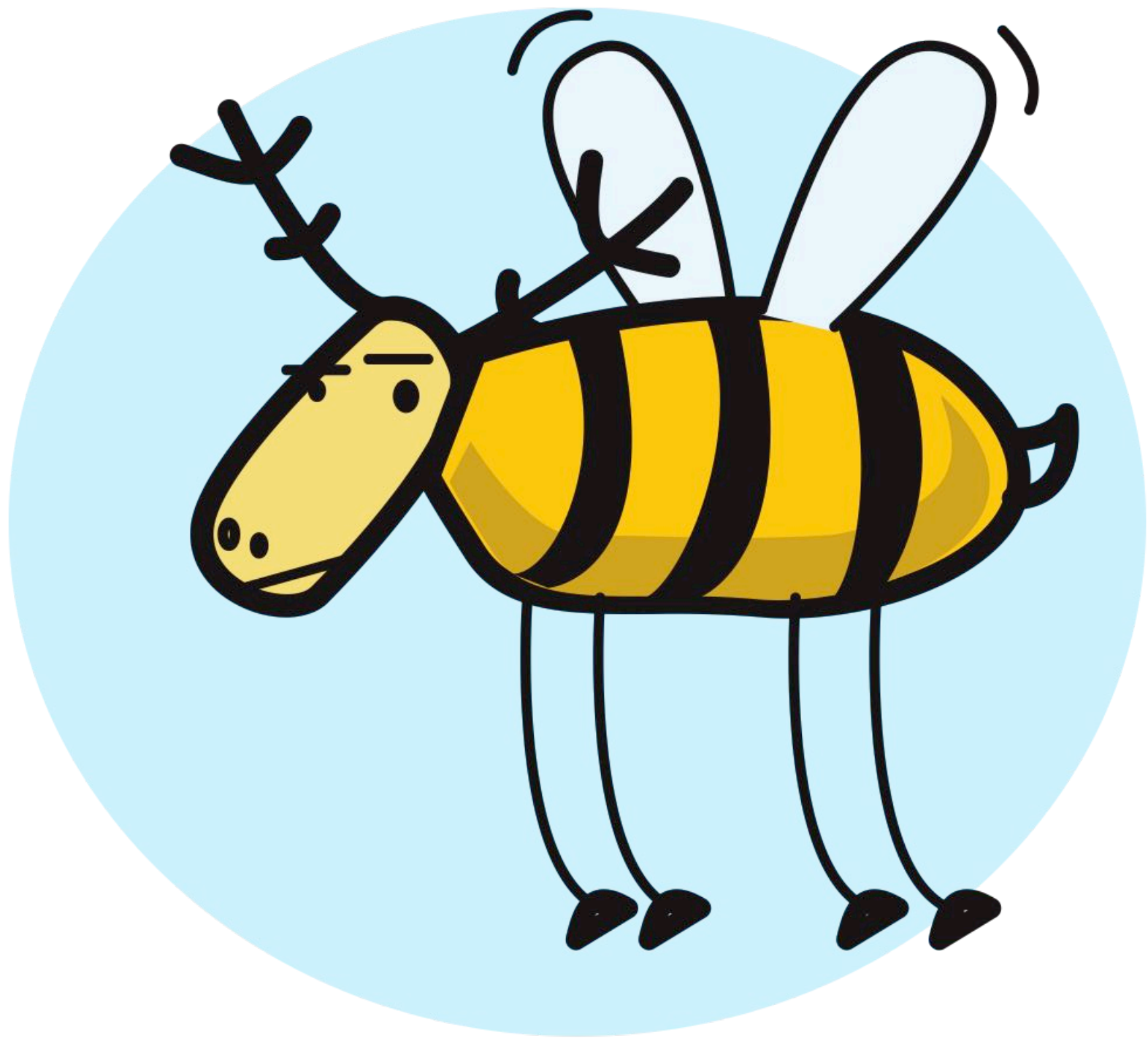
slack



fitbit

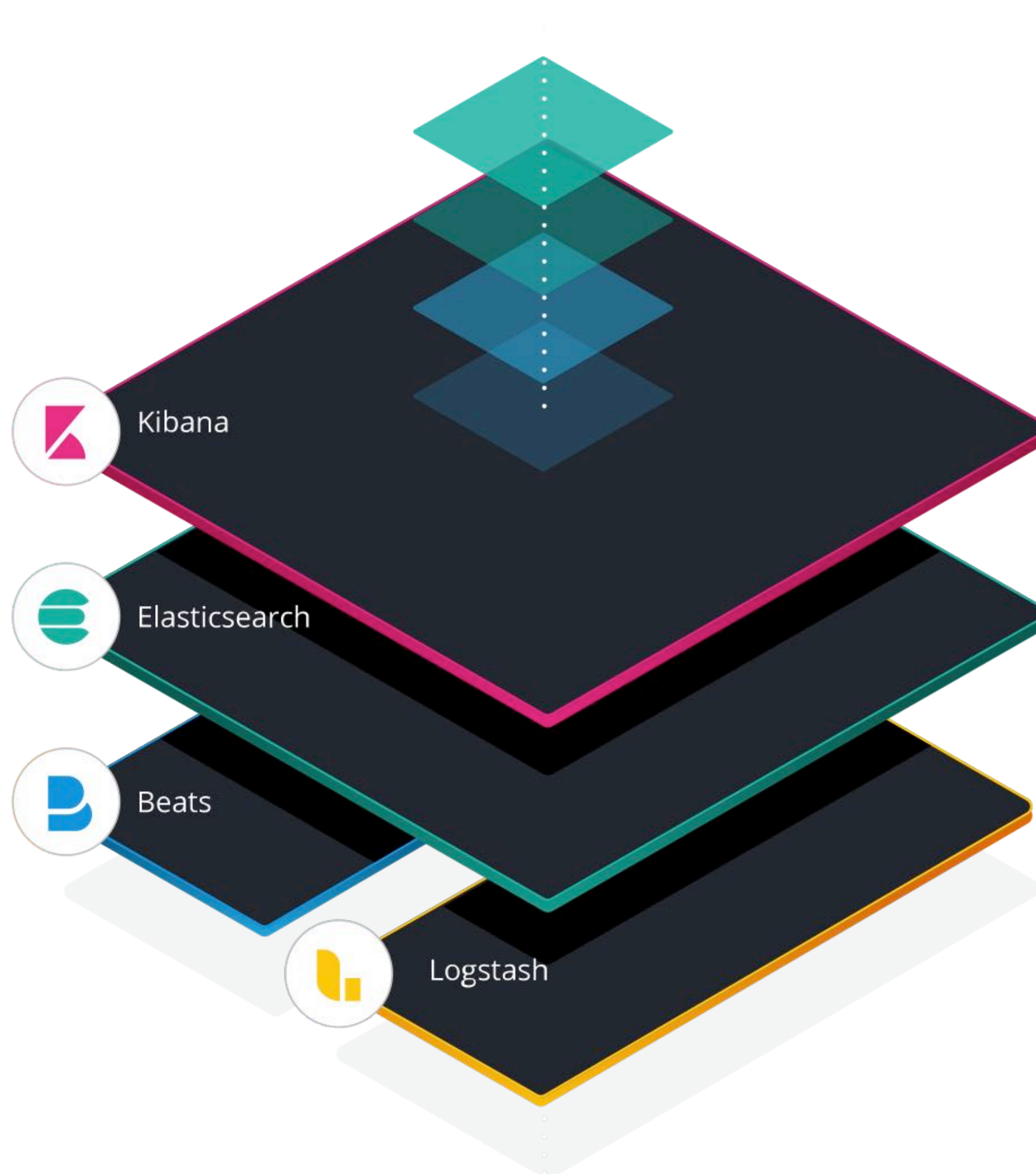
*Apparently, I'm an
ELKB personality.*







elastic stack





Apache License 2.0

Disclaimer

I build **highly** monitored Hello World
apps

Example: Java

SLF4J, Logback, MDC

.NET: NLog

PHP: Monolog

JavaScript: Winston

...

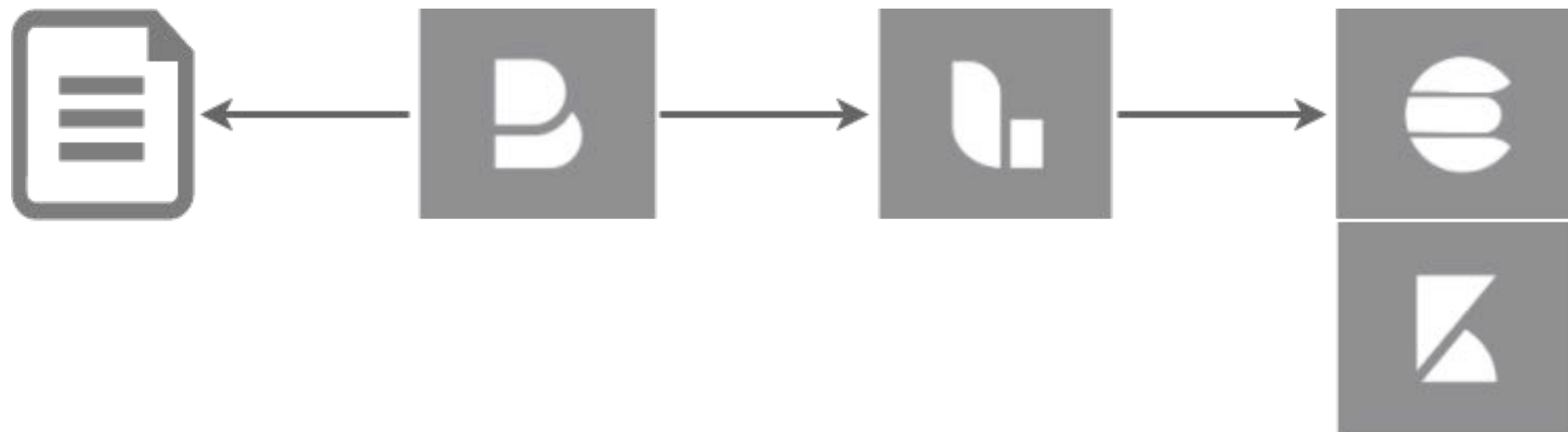
Anti-Pattern: `print`

```
System.out.println("Oops");
```

Anti-Pattern: Coupling

Parse





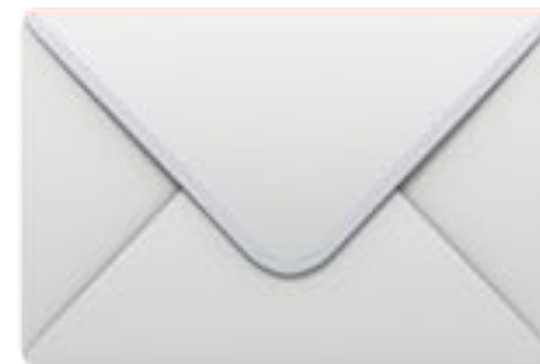
```
[2018-09-28 10:30:38.516] ERROR net.xeraa.logging.LogMe [main] - user_experience=🤪, session=46, loop=15 - Wake me up at night  
java.lang.RuntimeException: Bad runtime...  
    at net.xeraa.logging.LogMe.main(LogMe.java:30)
```

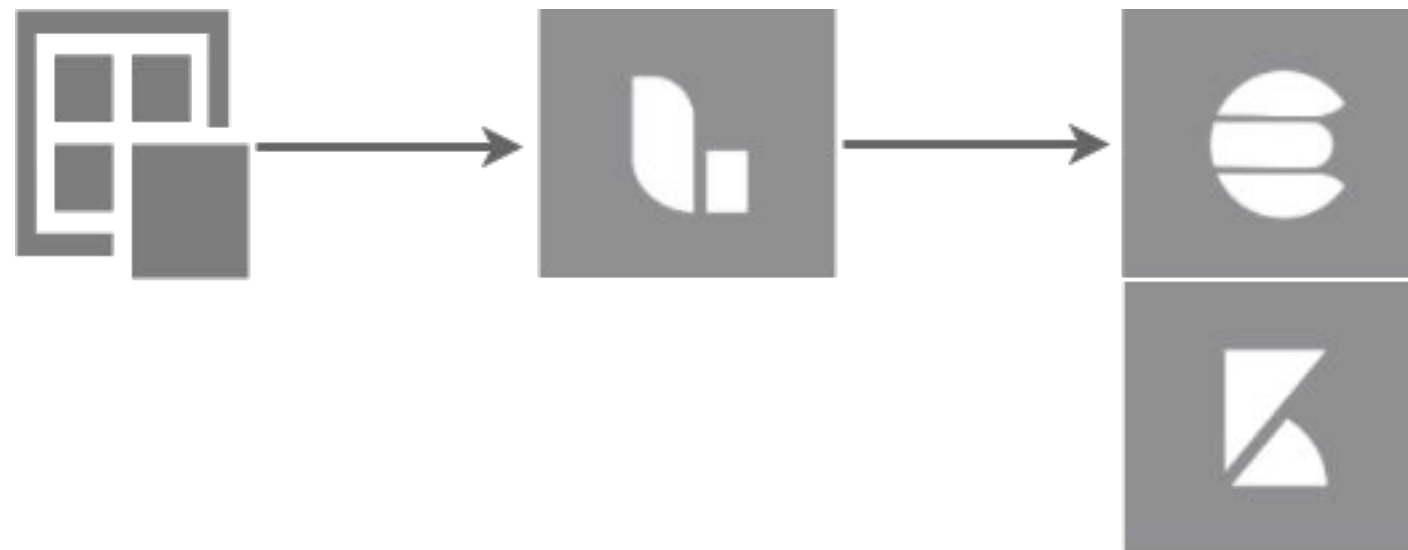
```
^\[%{TIMESTAMP_ISO8601:timestamp}\] %{SPACE} %{LOGLEVEL:level}  
  %{SPACE} %{USERNAME:logger} %{SPACE} \[%{WORD:thread}\]  
  %{SPACE} - %{SPACE} %{GREEDYDATA:mdc} %{SPACE} - %{SPACE}  
  %{GREEDYDATA:themessage} (?:\n+(?<stacktrace>(?:.|\r|\n)+))?
```

Pro: No change

Con: RegEx, timestamp, multiline

Send





Pro: No files

Con: Outages & coupling

Structure



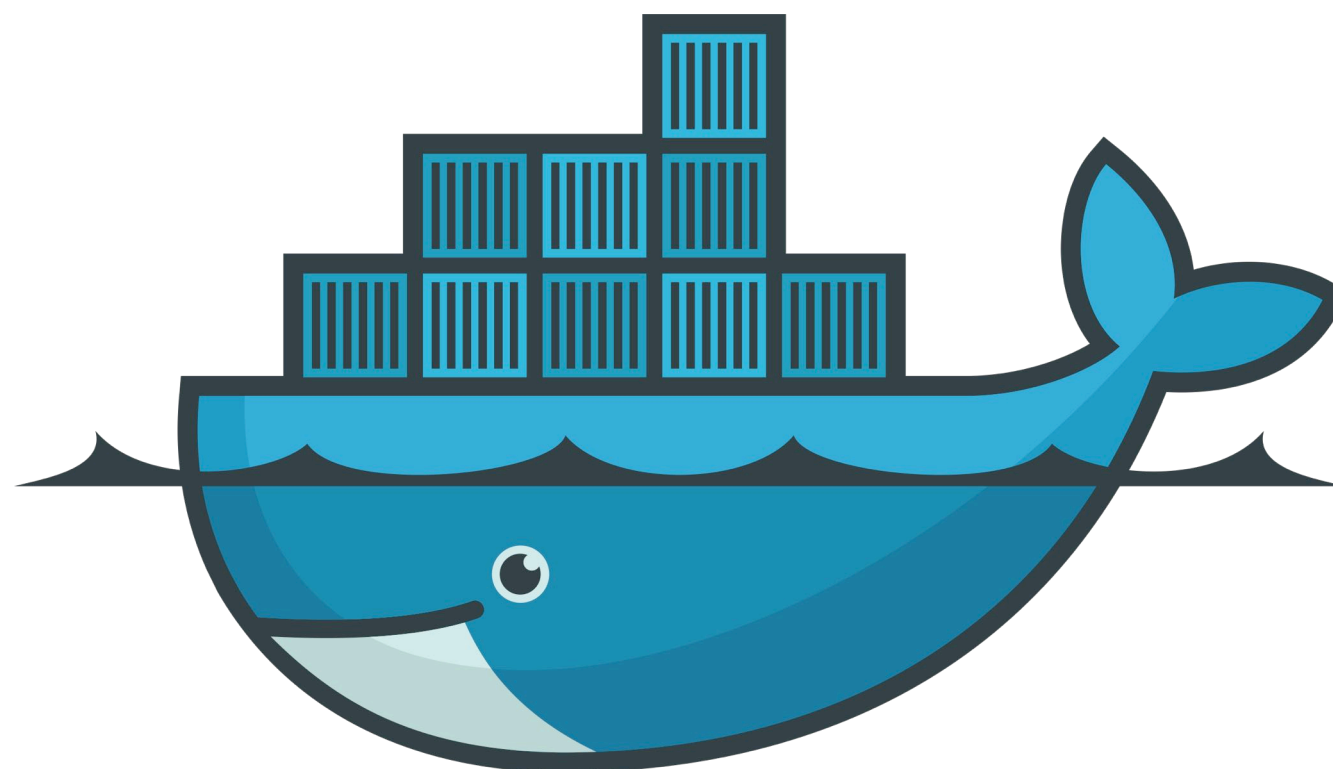


Pro: Right format

Con: JSON serialization overhead

Containerize



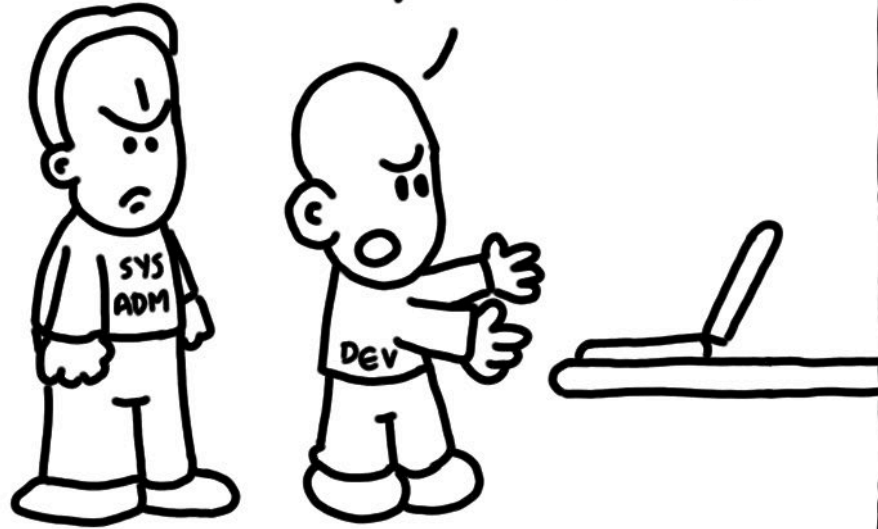


docker



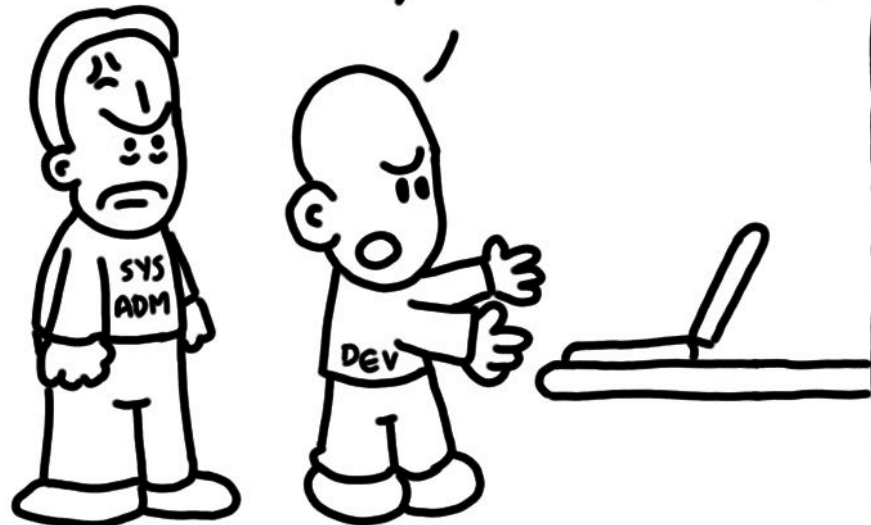
Before DevOps

It works on
my machine!!



After DevOps

It works on
my container!!



Daniel Stori {turnoff.us}

<https://turnoff.us/geek/before-devops-after-devops/>

Where to put Filebeat?

Sidecar

Default JSON log

```
filebeat.prospectors:
```

```
- type: log
```

```
  paths:
```

```
    - "/var/lib/docker/containers/*//*.log"
```

```
  json.message_key: log
```

```
  json.keys_under_root: true
```

```
processors:
```

```
- add_docker_metadata: ~
```

Metadata

```
{  
  "host": "10.4.15.9",  
  "port": 6379,  
  "docker": {  
    "container": {  
      "id": "382184ecdb385cf5d1f1a65f78911054c8511ae009635300ac28b4fc357ce51",  
      "name": "my-java",  
      "image": "my-java:1.0.0",  
      "labels": {  
        "app": "java"  
      }  
    }  
  }  
}
```

Mount log path

my-java:

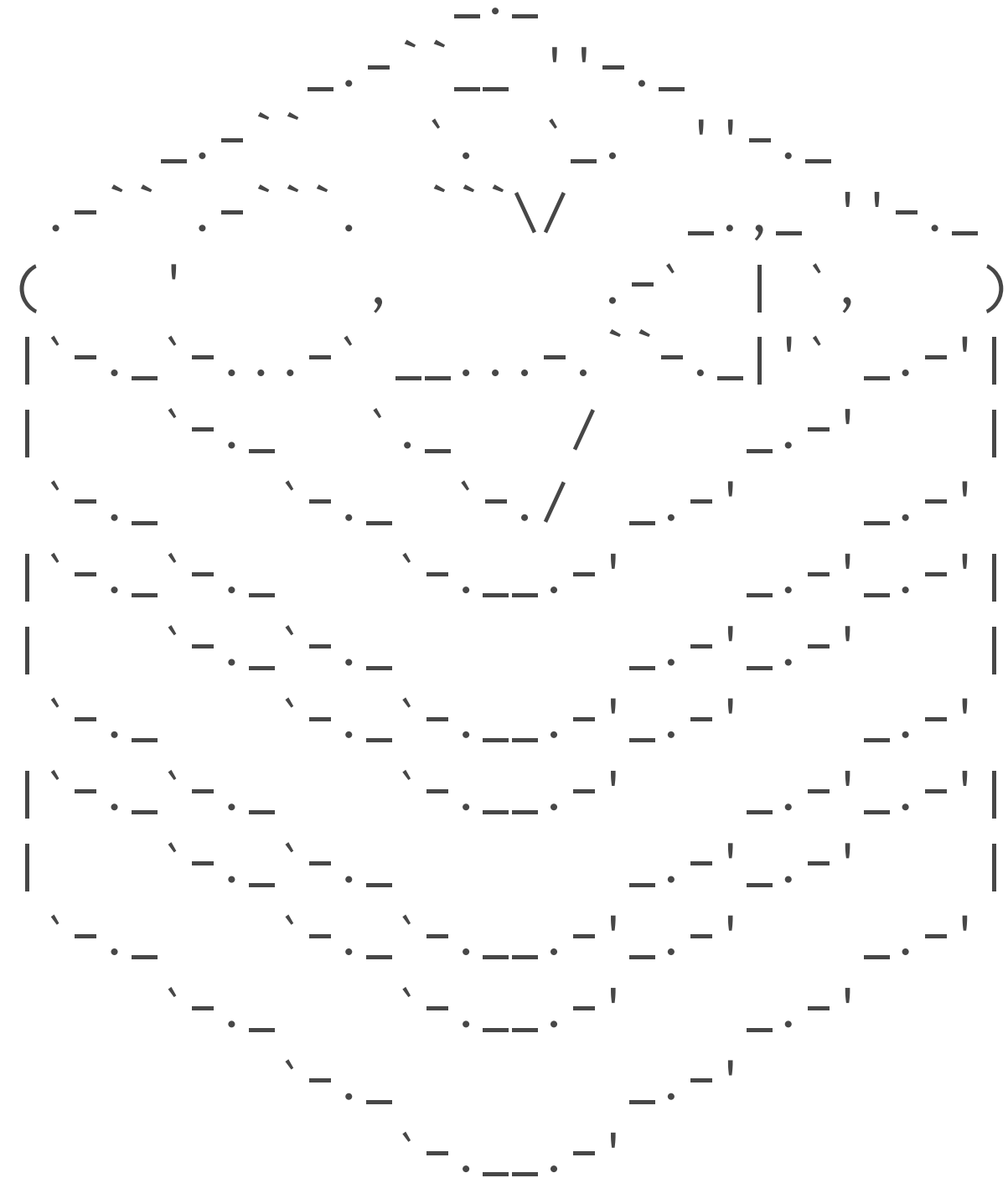
```
container_name: my-java
hostname: my-java
build: ${PWD}/config/my-java
networks: ['stack']
command: java -jar my-java.jar
volumes:
  - ./logs/my-java/:/opt/my-java/logs/
```

filebeat:

```
container_name: filebeat
hostname: filebeat
image: "docker.elastic.co/beats/filebeat:${ELASTIC_VERSION}"
volumes:
  - ./logs/my-java/:/var/log/my-java/
  - ./docker-compose/filebeat.yml:/usr/share/filebeat/filebeat.yml:ro
command: filebeat -e
networks: ['stack']
```

Registry file

`filebeat.registry_file: /usr/share/filebeat/data/registry`



Redis 4.0.9 (00000000/0) 64 bit

Running in stand alone mode

Port: 6379

PID: 55757

<http://redis.io>

Configuration templates

```
filebeat.autodiscover:
  providers:
    - type: docker
      templates:
        - condition:
            equals:
              docker.container.image: redis
  config:
    - type: docker
      containers.ids:
        - "${data.docker.container.id}"
      exclude_lines: ["^\\s+[[\\-`('.|_]]"] # Drop asciiart lines
```

Pro: Hot 🍌

Con: Complexity

Orchestrate





kubernetes



@xeraa

Where to put Filebeat?

DaemonSet

Metadata

processors:

- add_kubernetes_metadata:
 in_cluster: true

Metadata

```
{
  "host": "172.17.0.21",
  "port": 9090,
  "kubernetes": {
    "container": {
      "id": "382184ecdb385cfd5d1f1a65f78911054c8511ae009635300ac28b4fc357ce51",
      "image": "my-java:1.0.0",
      "name": "my-java"
    },
    "labels": {
      "app": "java",
    },
    "namespace": "default",
    "node": {
      "name": "minikube"
    },
    "pod": {
      "name": "java-2657348378-k1pnh"
    }
  },
}
```

Configuration templates

```
filebeat.autodiscover:
  providers:
    - type: kubernetes
      templates:
        - condition:
            equals:
              kubernetes.namespace: redis
  config:
    - type: docker
      containers.ids:
        - "${data.kubernetes.container.id}"
  exclude_lines: ["^\\s+[[\\-`('.|_]]"] # Drop asciiart lines
```

Customize indices

```
output.elasticsearch:
```

```
  index: "%{[kubernetes.namespace]:filebeat}-%{[beat.version]}-%{+yyyy.MM.dd}"
```


Pro: Hot 🍌🍌🍌

Con: Complexity++

Conclusion

Examples

<https://github.com/xeraa/java-logging>

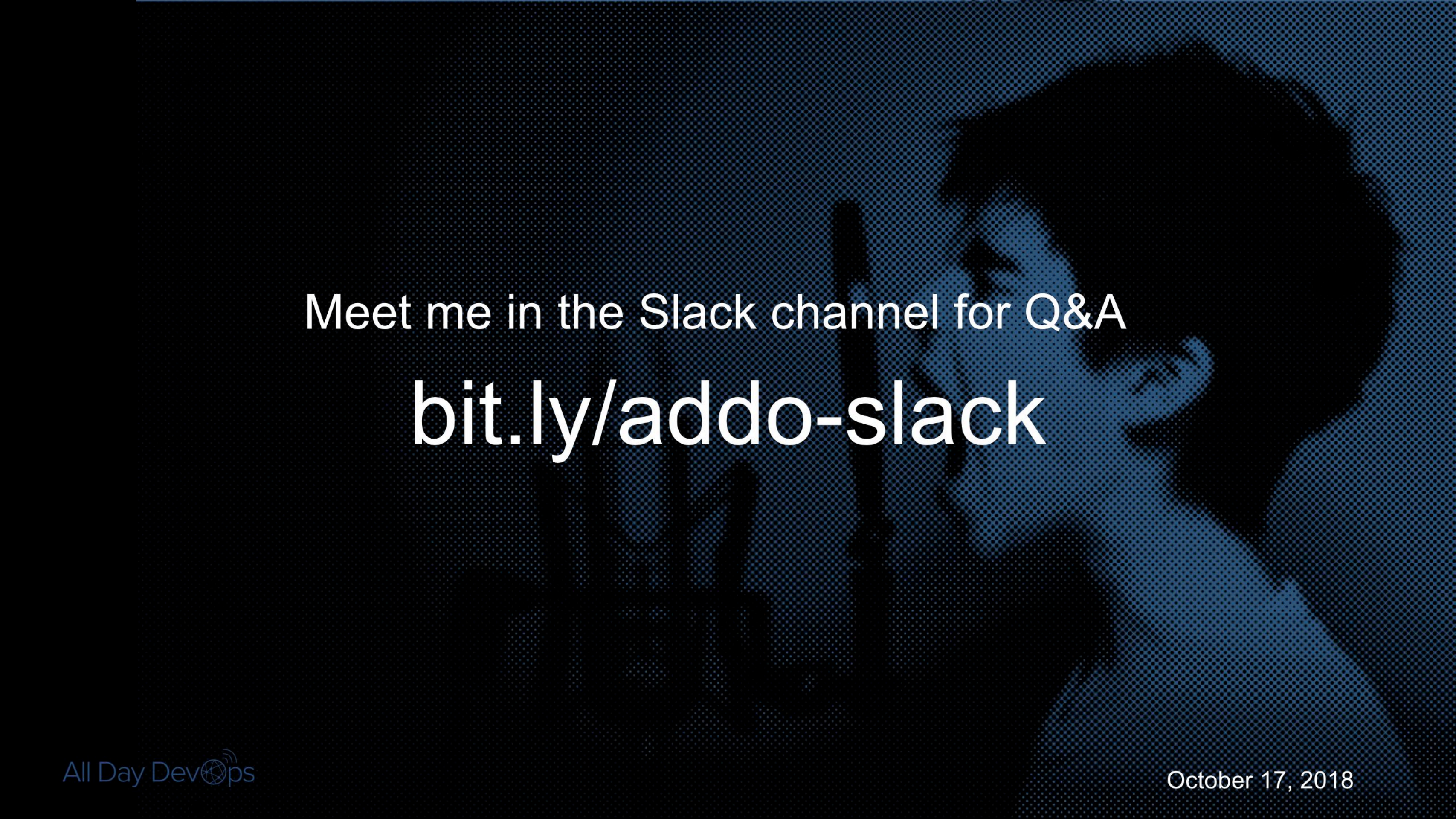
Parse 

Send 

Structure 

Containerize 

Orchestrate 



Meet me in the Slack channel for Q&A

bit.ly/addo-slack