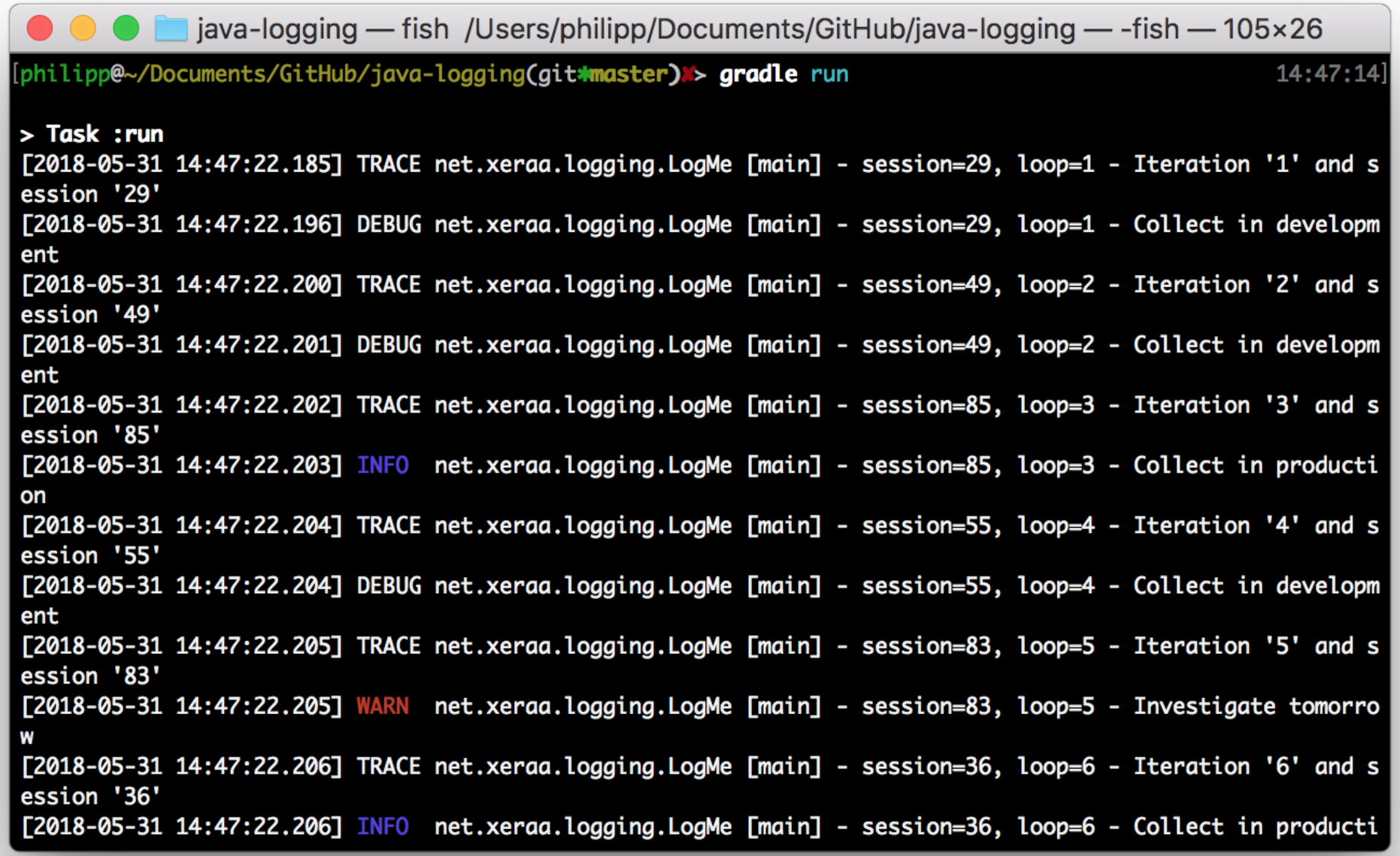
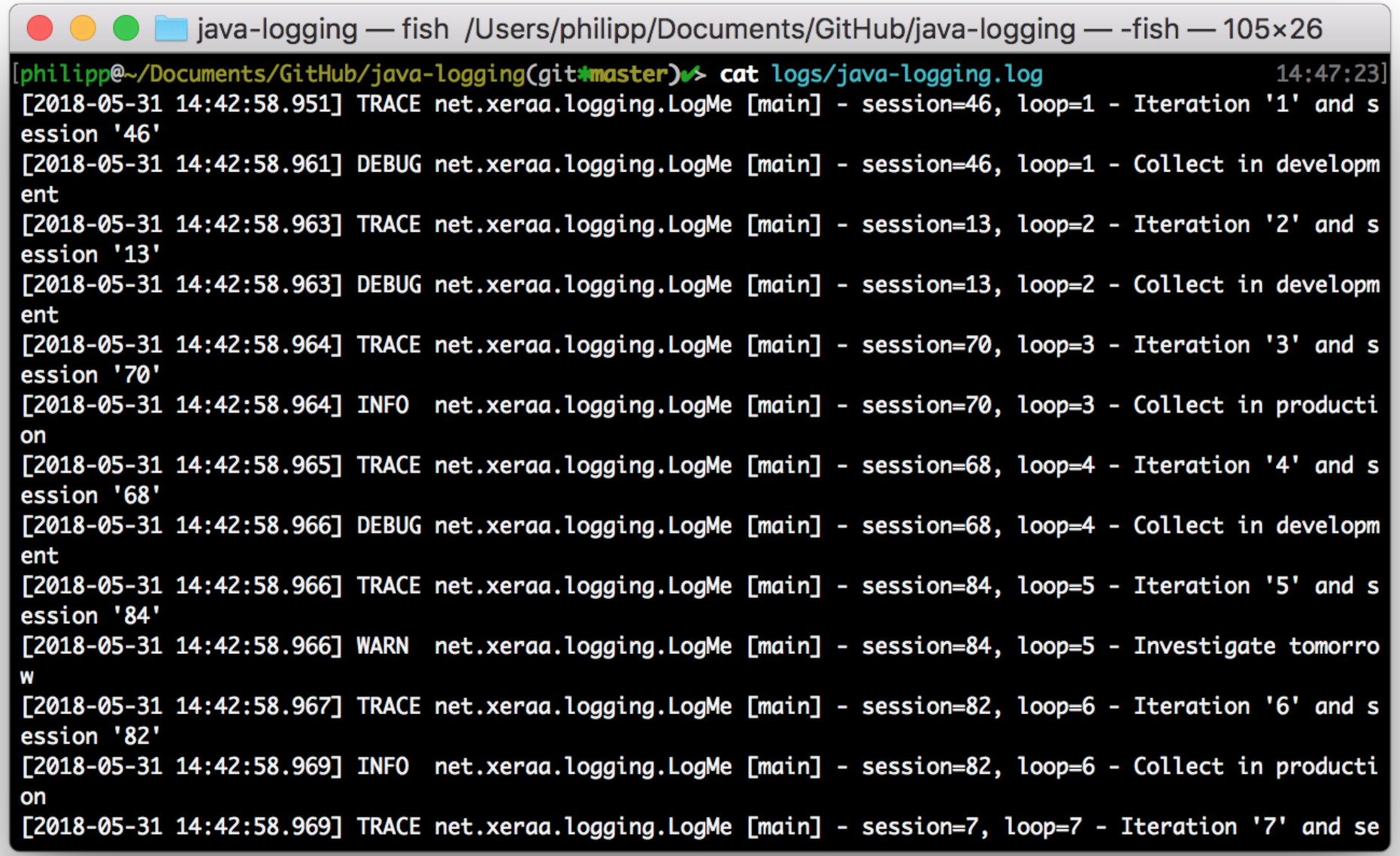
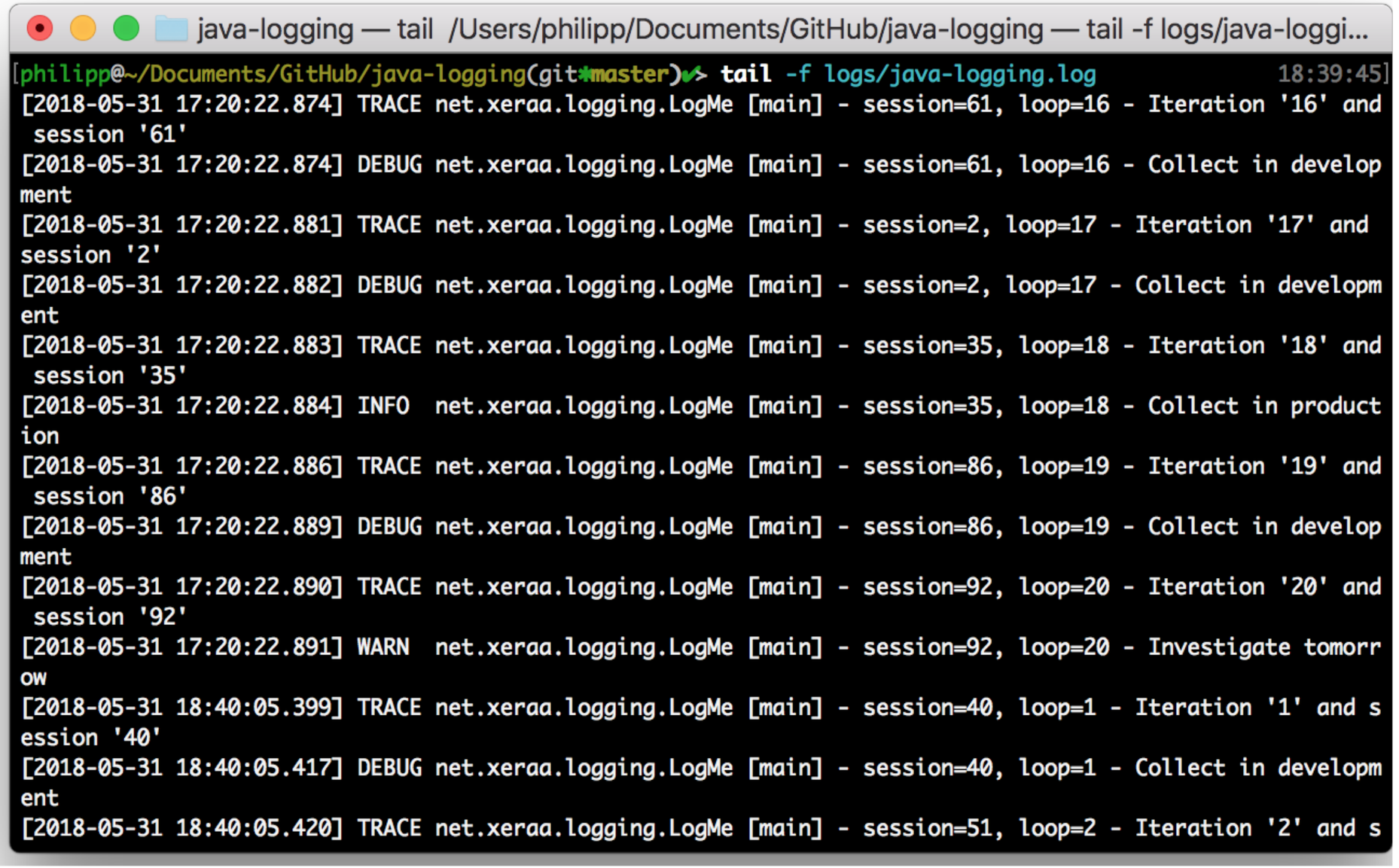
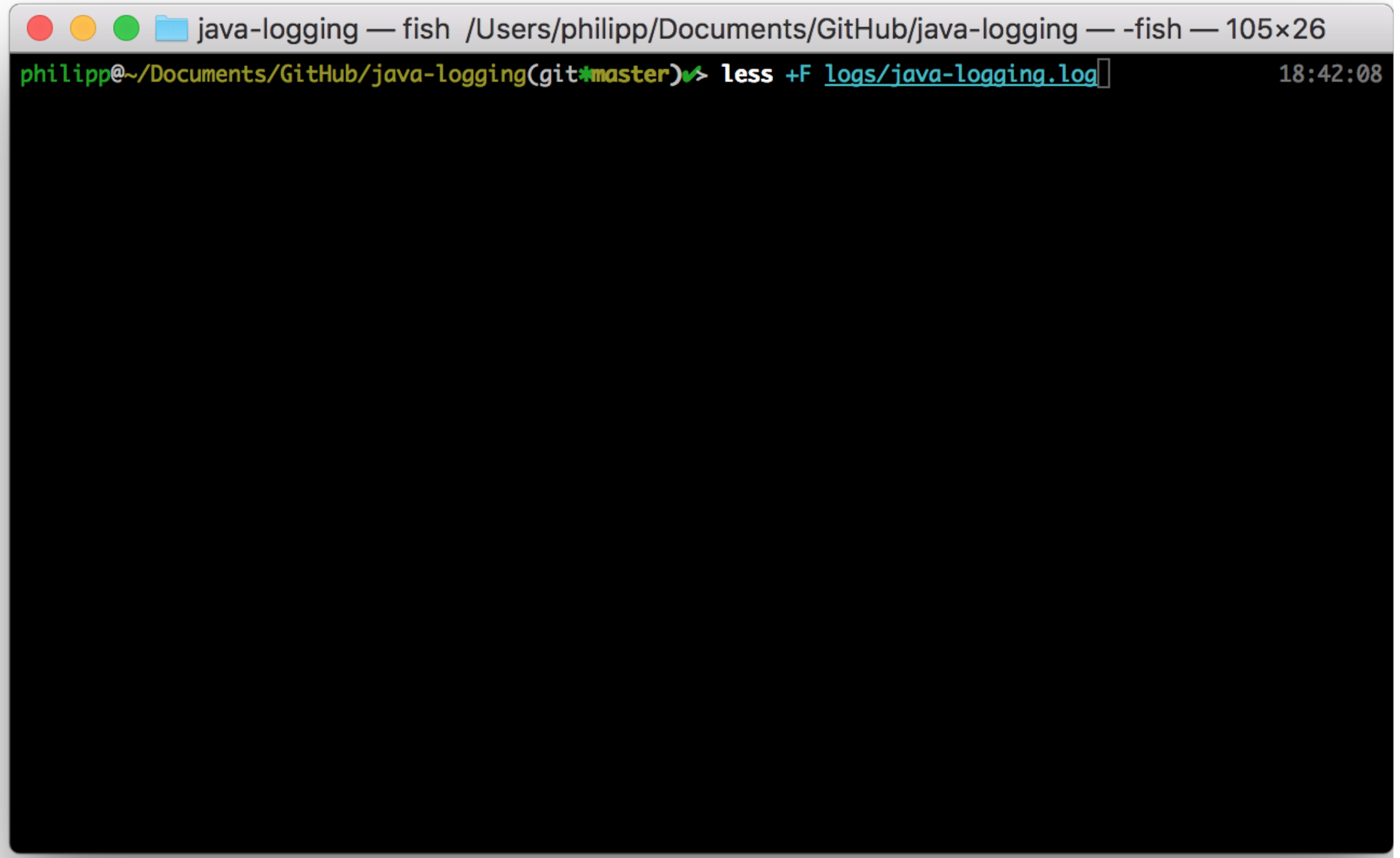
Aggregierte Logging-Patterns

Philipp Krenn @xeraa

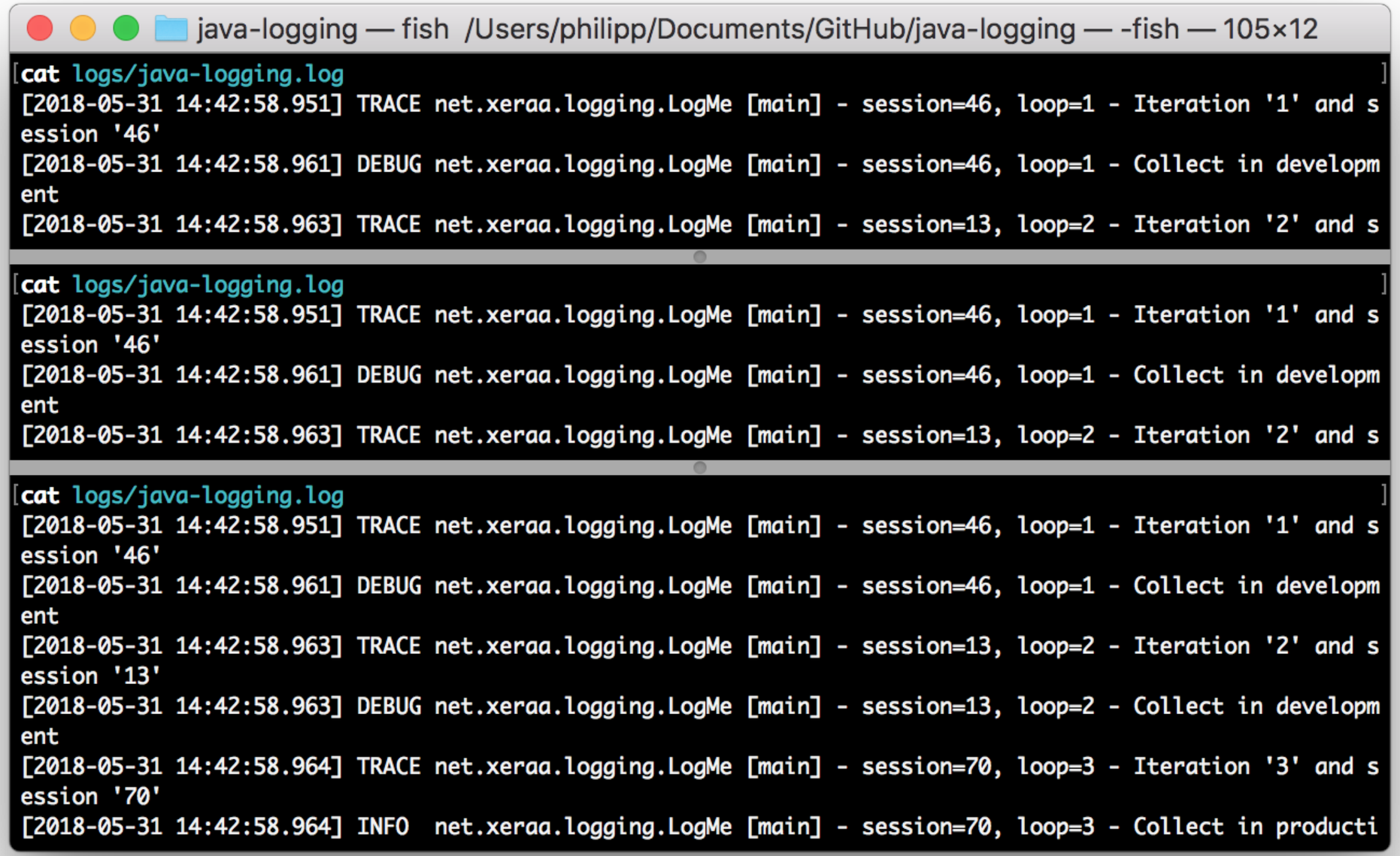

java-logging — fish /Users/philipp/Documents/GitHub/java-logging — -fish — 105×26
[philipp@~/Documents/GitHub/java-logging(git*master)✘> gradle run 14:47:14]
> Task :run
[2018-05-31 14:47:22.185] TRACE net.xeraa.logging.LogMe [main] - session=29, loop=1 - Iteration '1' and session '29'
[2018-05-31 14:47:22.196] 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 — 105×26
[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 development
[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 development
[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 production
[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 development
[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 tomorrow
[2018-05-31 18:40:05.399] TRACE net.xeraa.logging.LogMe [main] - session=40, loop=1 - Iteration '1' and session '40'
[2018-05-31 18:40:05.417] DEBUG net.xeraa.logging.LogMe [main] - session=40, loop=1 - Collect in development
[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 — 105×26
philipp@~/Documents/GitHub/java-logging(git:master)> less +F logs/java-logging.log
18:42:08


THIS IS FINE.


java-logging — fish /Users/philipp/Documents/GitHub/java-logging — -fish — 105×12
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'
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java-logging — fish /Users/philipp/Documents/GitHub/java-logging — -fish — 105×1

```
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

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cat logs/java-logging.log
```
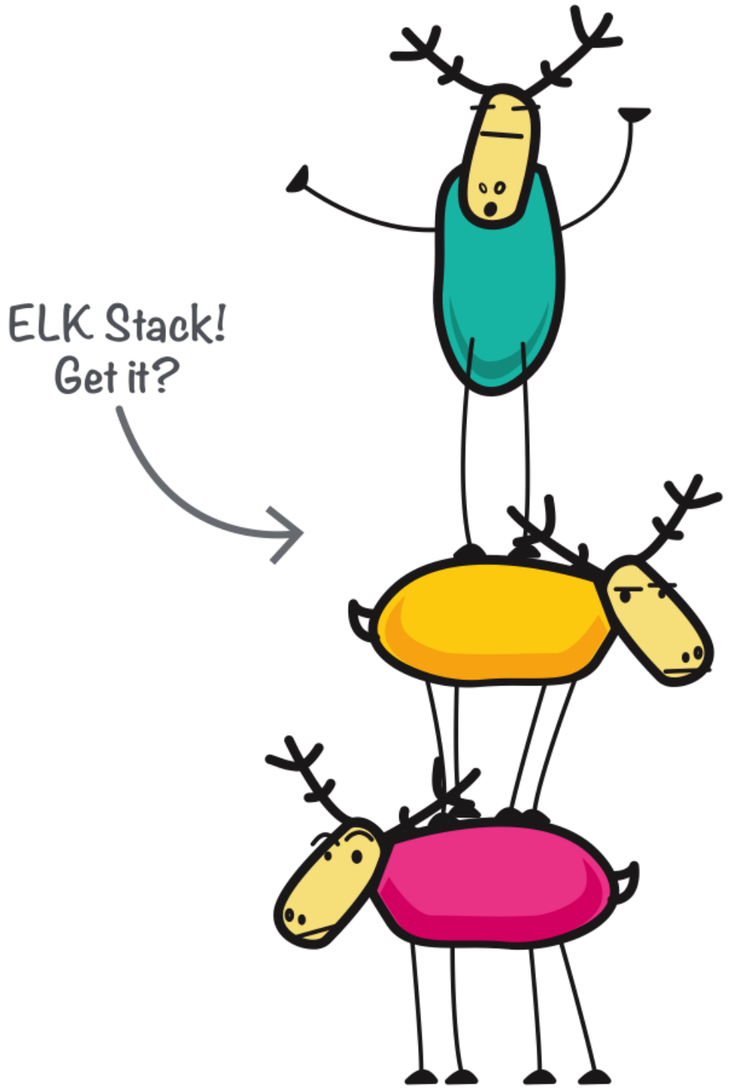


TH-
THIS IS NOT FINE!!
OH MY GOD EVERY THINGS ON FIRE
WHAT THE HELL IS MY PROBLEM


ALL THE THINGS!

elastic

Developer 🥑



E Elasticsearch

L Logstash

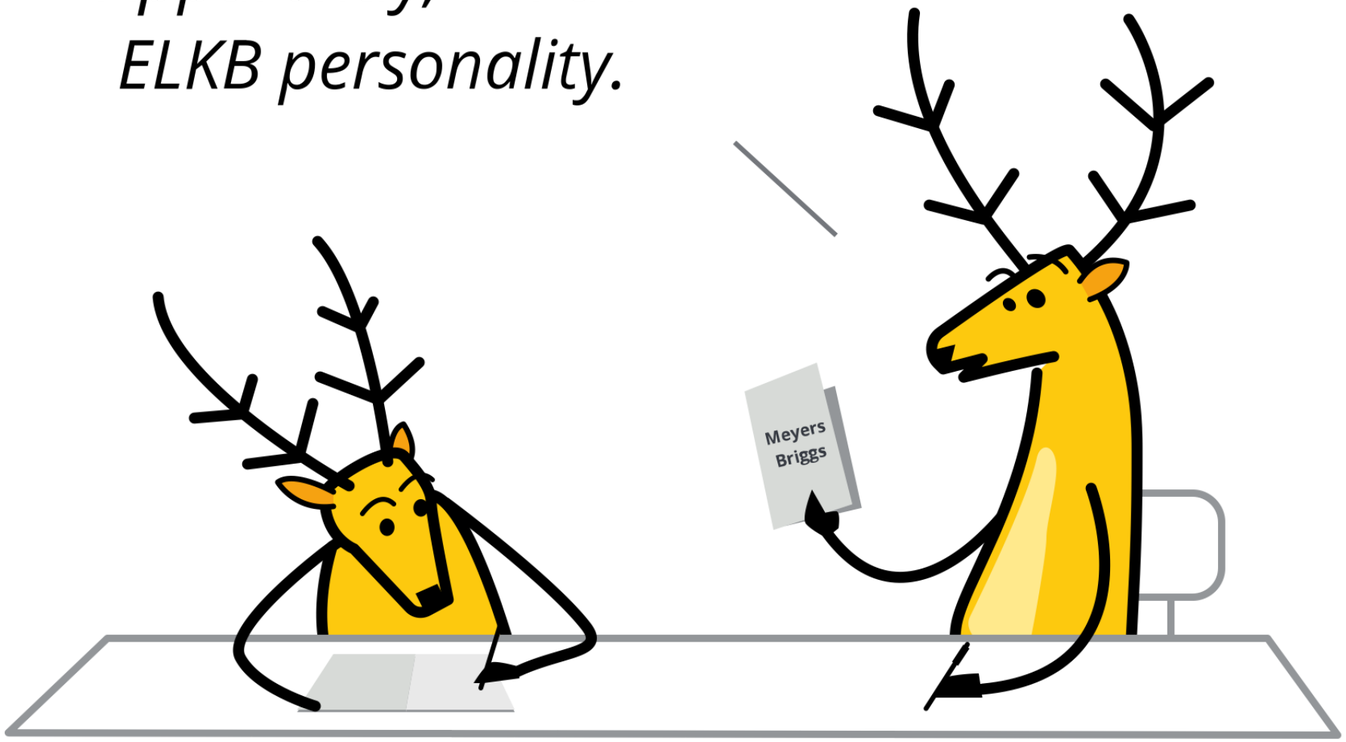
K Kibana

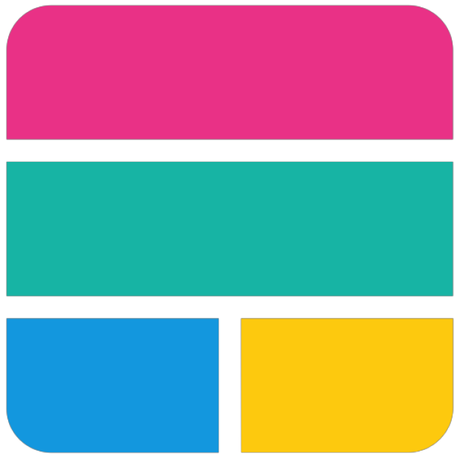

lyft


slack

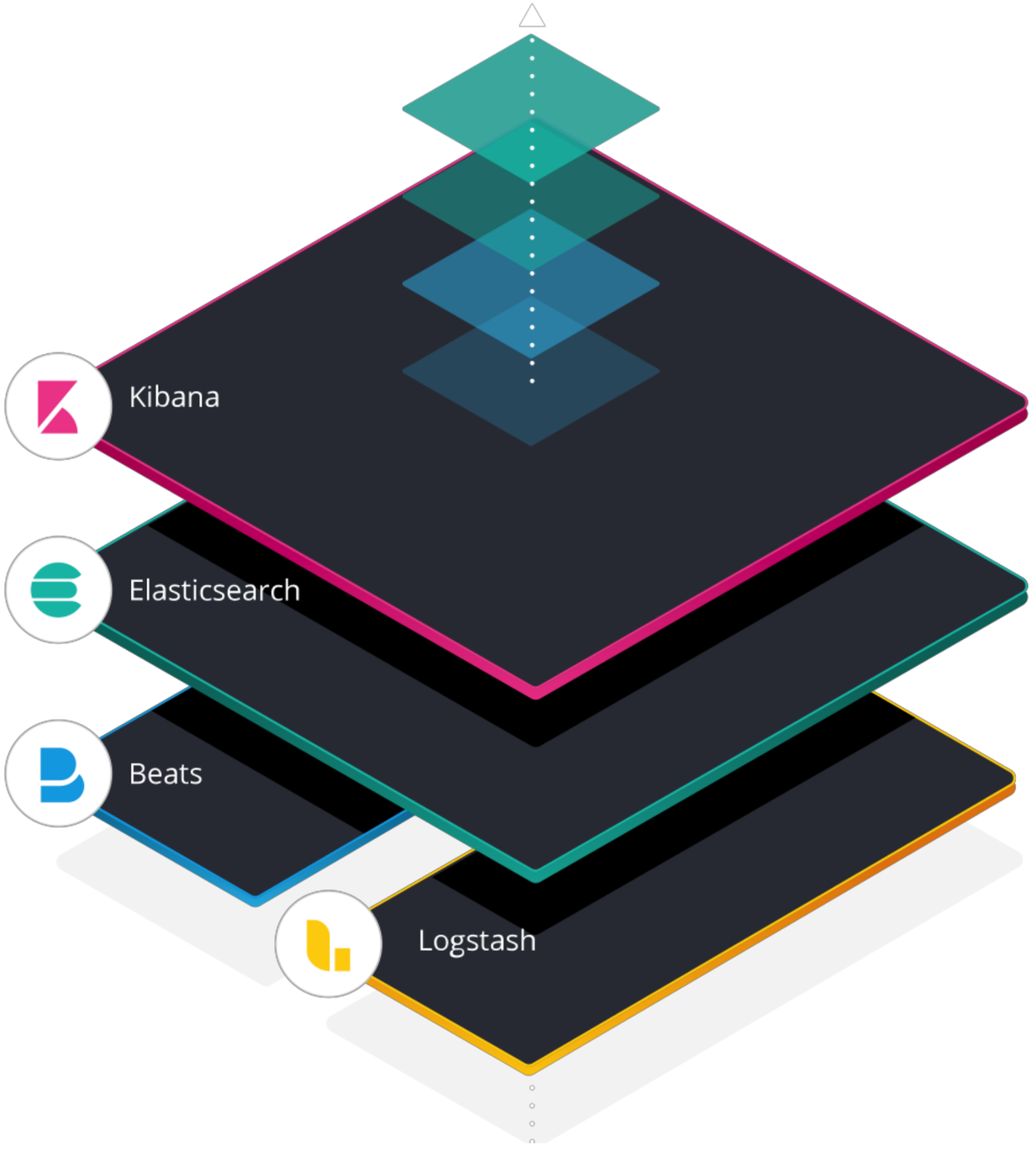

fitbit

Apparently, I'm an ELKB personality.





elastic stack


Kibana
Elasticsearch
Beats
Logstash

Licensing

Open Source Apache-2.0

Basic free

Commercial 

Disclaimer

I build **highly** monitored Hello World apps

Example: Java

SLF4J, Logback, MDC

And Everywhere Else

.NET: NLog

PHP: Monolog

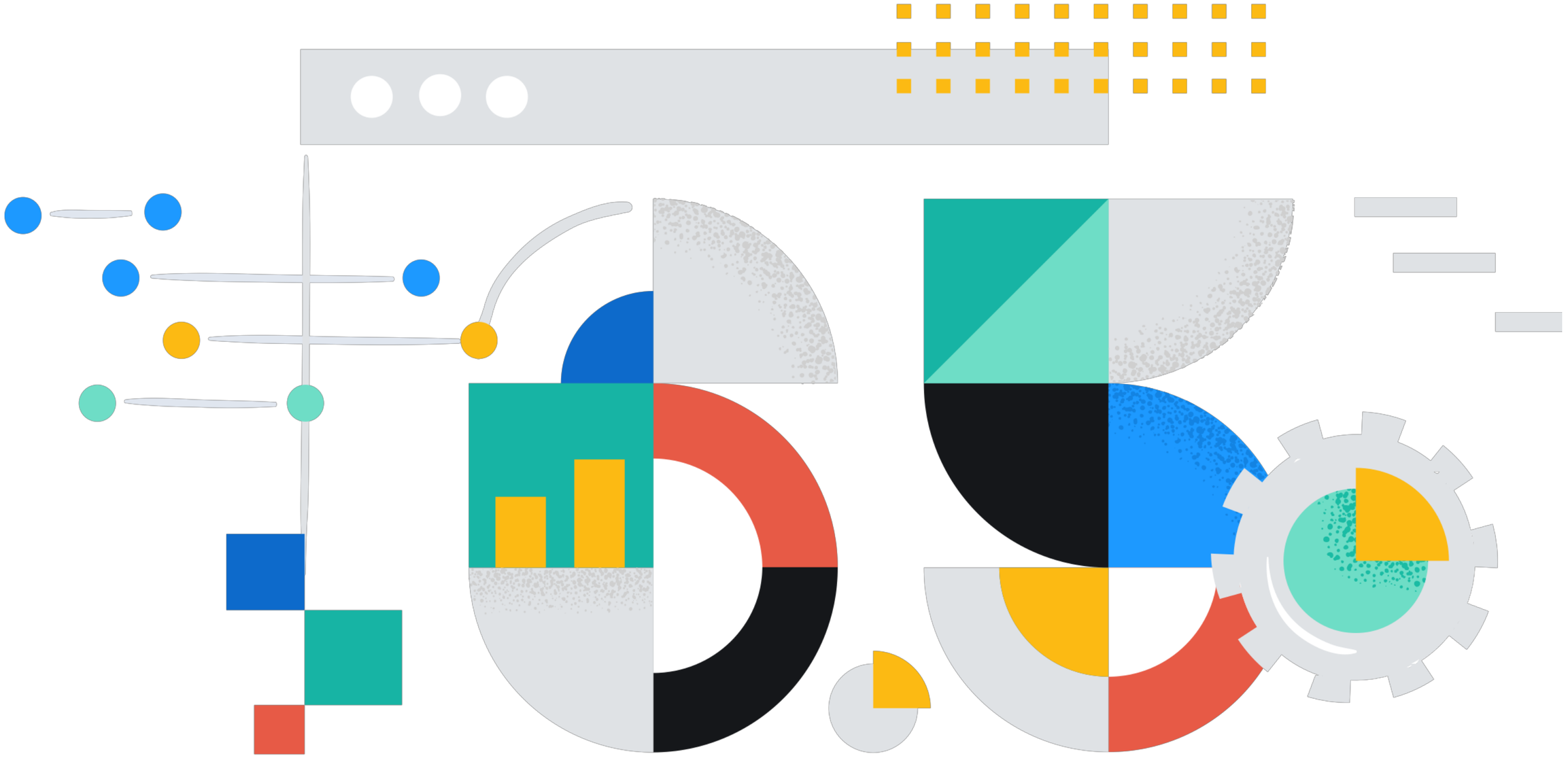
JavaScript: Winston

Python: structlog

Anti-Pattern: `print`

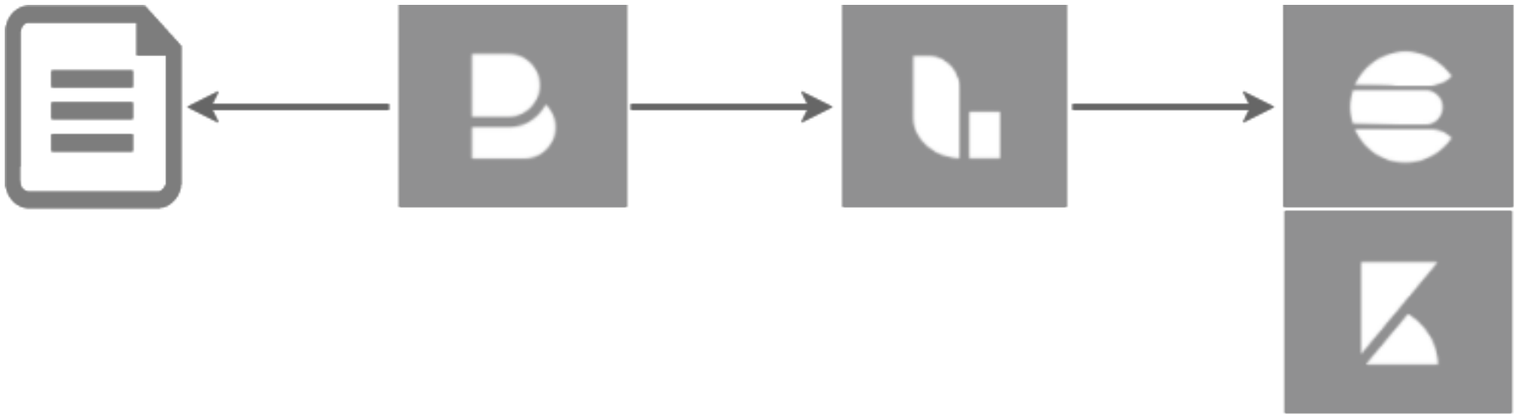
```
System.out.println("Oops");
```

Anti-Pattern: Coupling




HOLD ON TO YOUR BUTTS

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)+))?
```

Elastic Common Schema

https://github.com/elastic/ecs

Helpers

Dev Tools: Grok Debugger

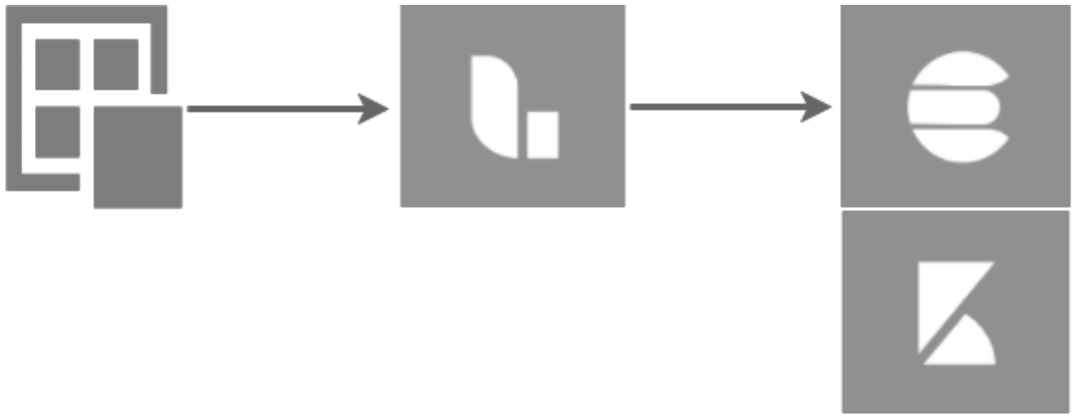
Machine Learning: Data Visualizer

Log UI

Pro: No change

Con: RegEx, timestamp, multiline

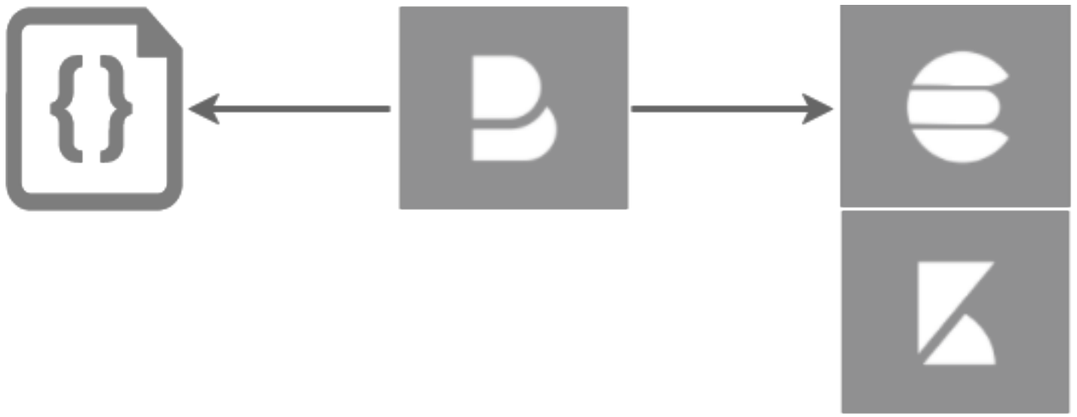
Send 



Pro: No files

Con: Outages & coupling

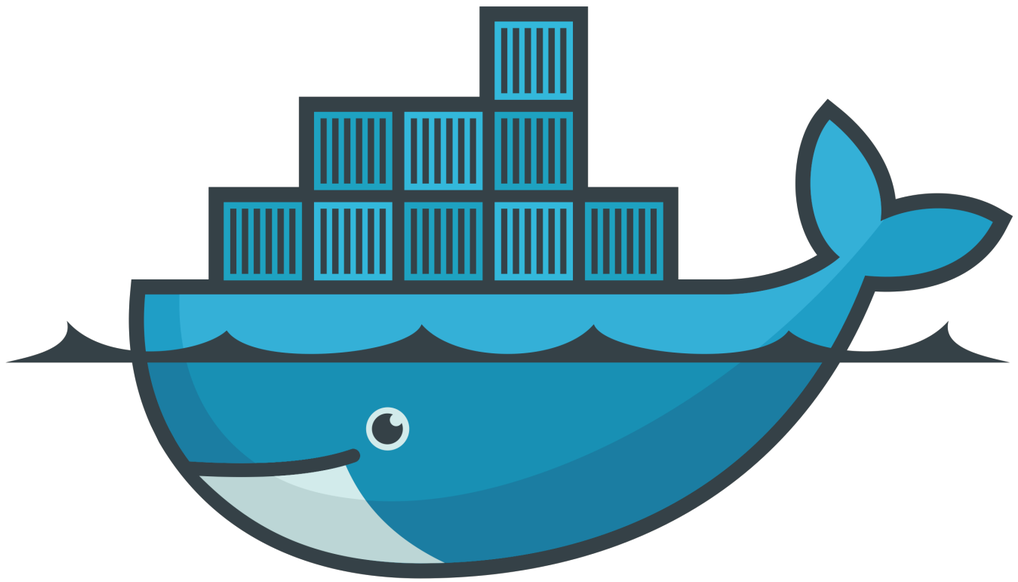
Structure



Pro: Right format

Con: JSON serialization overhead

Containerize 



docker

elastic

@xeraa

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: ~
- add_host_metadata: ~
```

Metadata

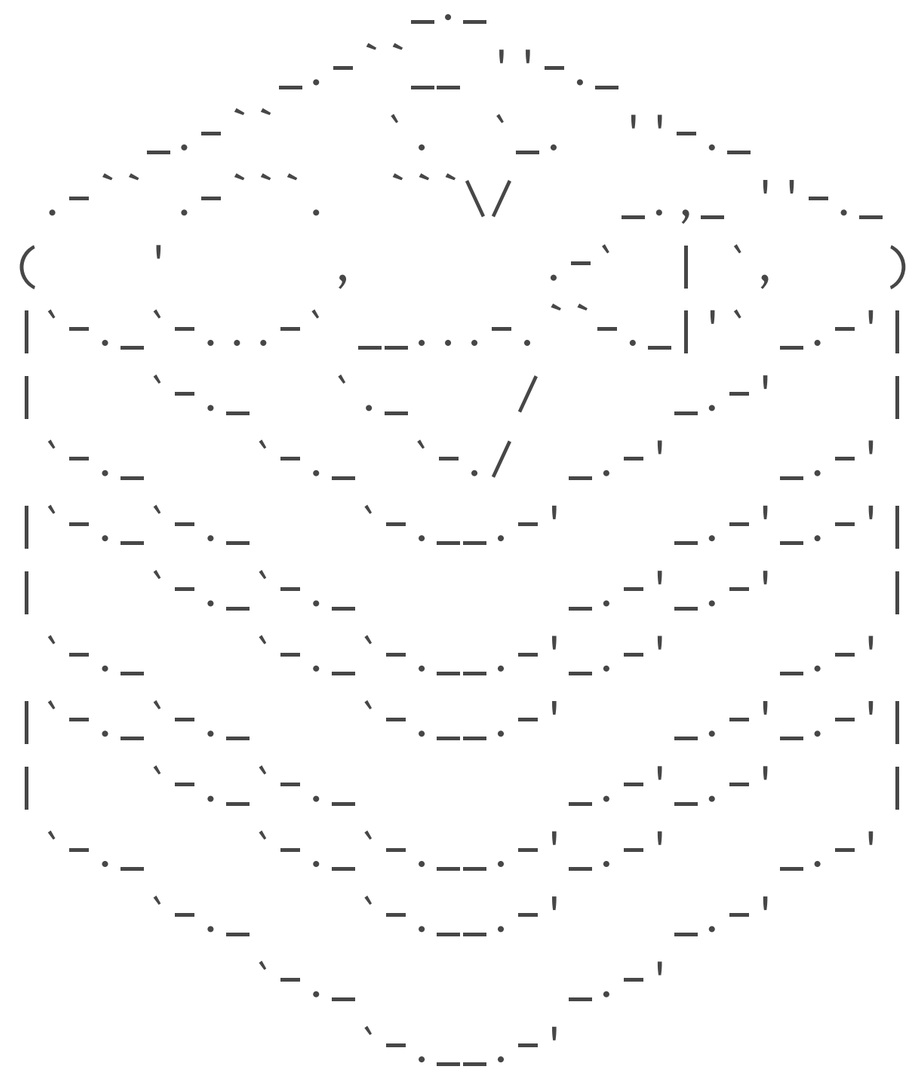

```
{
  "host": "10.4.15.9",
  "port": 6379,
  "docker": {
    "container": {
      "id": "382184ecdb385cfd5d1f1a65f78911054c8511ae009635300ac28b4fc357ce51",
      "name": "my-java",
      "image": "my-java:1.0.0",
      "labels": {
        "app": "java"
      }
    }
  }
}
```

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
```

Infrastructure UI

Pro: Hot 💩

Con: Complexity

Orchestrate 

kubernetes

elastic

@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

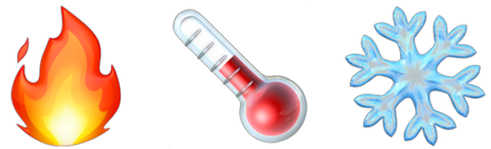
```
output.elasticsearch:
  index: "%{[kubernetes.namespace]:filebeat}-%{[beat.version]}-%{+yyyy.MM.dd}"
```

Pro: Hot 💩💩💩

Con: Complexity++

Moar 

Architecture



Index lifecycle management

Select a template — 2 Configure a policy — 3 Review and save

Select or create a policy

An index lifecycle policy is a blueprint for transitioning your data over time. You can create a new policy or edit an existing policy and save it with a new name.

Existing policies

my_policy5

Create new policy

Edit policy my_policy5

Configure the phases of your data and when to transition between them.

Hot phase

This phase is required. Your index is being queried and actively written to. You can optimize this phase for write throughput.

Enable rollover

If true, rollover the index when it gets too big or too old. The alias switches to the new index. Learn more

Maximum index size

3

gigabytes

Maximum age

days

Warm phase

Your index becomes read-only when it enters the warm phase. You can optimize this phase for search.

Remove warm phase

Rollover configuration

Move to warm phase on rollover

Move to warm phase after

0 days

Where would you like to allocate these indices?

warm node:true (1)

View node details

Number of replicas

Set to same as hot phase

Shrink

Shrink the index into a new index with fewer primary shards. Learn more

Shrink index

Number of primary shards

Set to same as hot phase

Force merge

Reduce the number of segments in your shard by merging smaller files and clearing deleted ones. Learn more

Force merge data

Cold phase

Your index is queried less frequently and no longer needs to be on the most performant hardware.

Activate cold phase

Delete phase

Use this phase to define how long to retain your data.

Deactive cold phase

Configuration

Delete indices after

0

days

← Back

Continue →

Frozen Indices

https://github.com/elastic/elasticsearch/issues/34352

Centralized Logstash & Beats Management

Conclusion

Examples

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

Parse 🔪

Send ✉️

Structure 🕸

Containerize 📦

Orchestrate 🎻

Questions?

Philipp Krenn @xeraa