



Observability with Fluent Bit Logs, Metrics and Traces

Eduardo Silva
eduardo@calyptia.com

Anurag Gupta
anurag@calyptia.com



\$ whoami

Eduardo Silva



Creator and Maintainer of **Fluent Bit**

Co-Founder and CEO of **Calyptia**

CNCF friend

Anurag Gupta



Maintainer of **Fluent Bit**

Co-founder and VP of Product at **Calyptia**

CNCF friend





Complexity of Telemetry Data

Telemetry Data: why we need it ?

Goals

Data Analysis

Business Decisions

Challenges

Multiples Sources

Different data formats



Telemetry Data: Categories

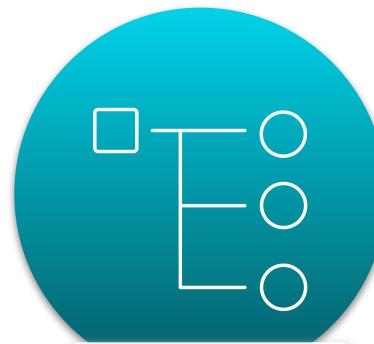
Let's focus on the 3 major types of Telemetry:



LOGS



METRICS



TRACES

Telemetry Data: Logs

Where Logs are generated

User level Applications

- JSON
 - Raw text - Unstructured
-

Service level applications

- Syslog
 - Systemd
 - /var/log/*
-

Kernel

- /dev/kmsg



Telemetry Data: Metrics

Metrics

Critical piece for performance monitoring and alerting, e.g:

- Performance: HTTP requests per second ?
- Alerting: how healthy are my services ?

Common Data types

- Counters
- Gauges
- Histograms
- Summaries



Telemetry Data: Traces

Traces

Main goal: correlate information from distributed applications

- Insights into how requests flow through a system
- How long each step/application takes ?

Implementation

- Internals: Spans and Attributes
- Application usually needs to be instrumented
 - Note : tracing with eBPF is possible without instrumenting the code :O





Telemetry Industry Standards

Industry Standards Tools



Fluent Bit



Fluentd



Rsyslog



Industry Standards Tools



Prometheus



Prometheus

OpenMetrics

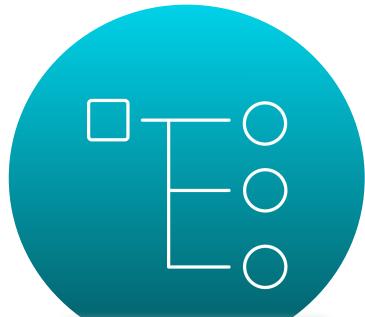


OPENMETRICS

Nagios

Nagios®

Industry Standards Tools



OpenTelemetry

OpenTracing (Archived)





Challenges with Telemetry

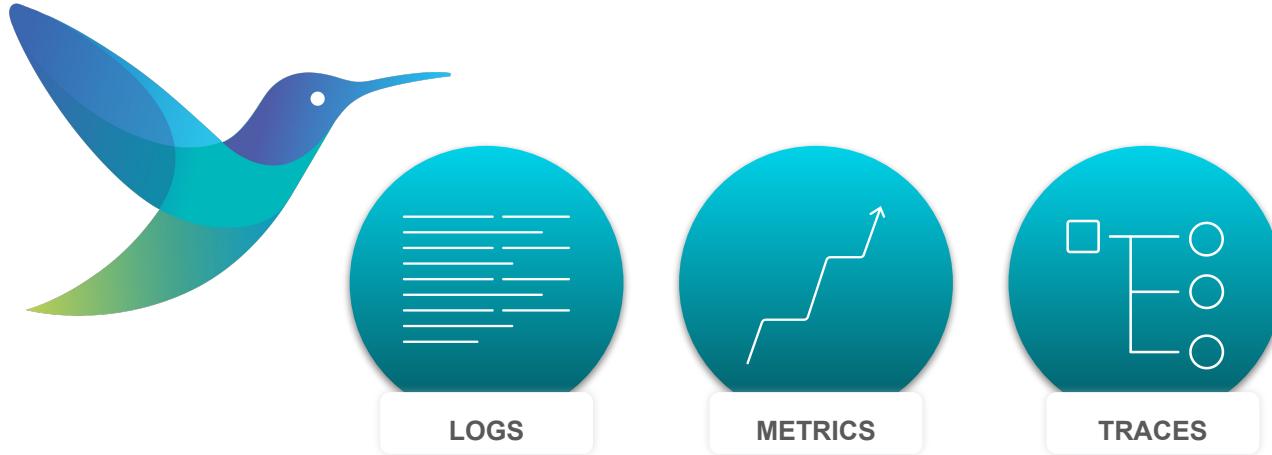
Industry Challenges

What do we need to deal with today ?

- Multiples sources & multiple formats
- Companies generates ~30% more data every year
- Backpressure
- Overall performance
 - Speed
 - Resource usage



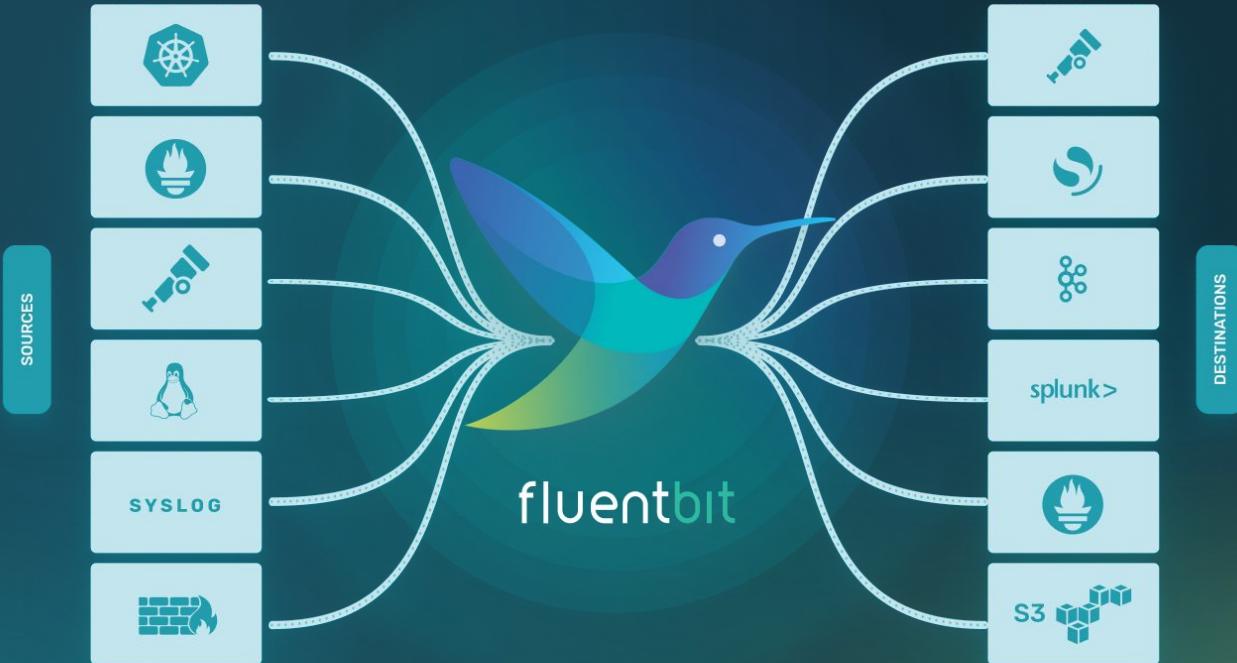
Fluent Bit: Telemetry Agent



Fluent Bit: Telemetry Agent

Trusted by





Fluent Ecosystem



Open Source Observability



No vendor lock-in



Product, Project and Platform agnostic





fluentbit

v.2.1

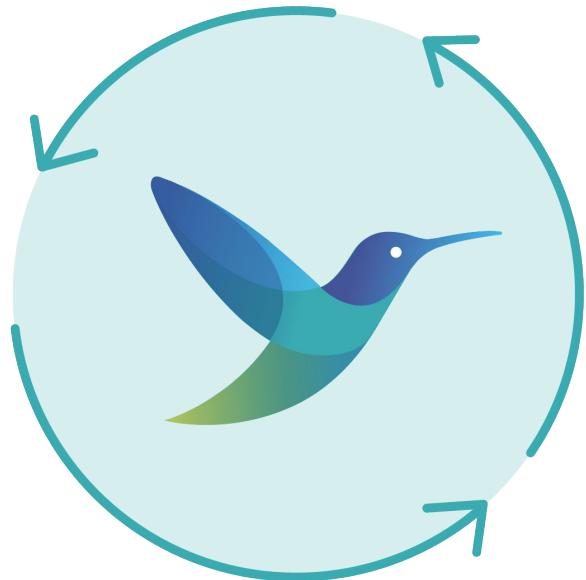
Fluent Bit v2.1

Hot Reload Support



Restart Fluent Bit seamlessly

Use SIGHUP or the new HTTP /api/v2/reload endpoint

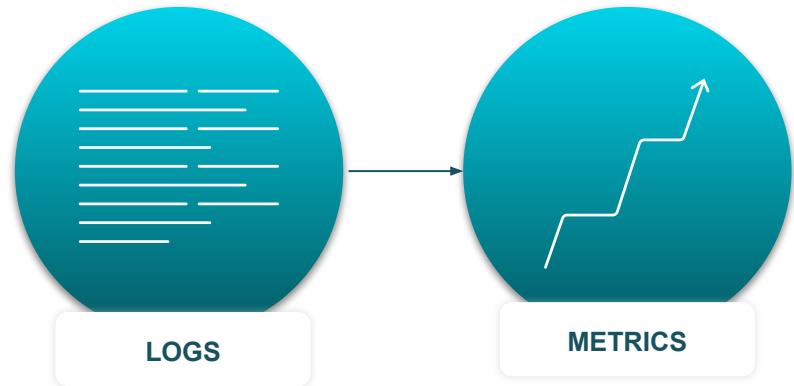


Fluent Bit v2.1

Convert from Logs to Metrics

Convert any value to a counter, gauge or histogram

Supports Kubernetes mode



Fluent Bit v2.1

Windows host metrics



Enhanced WMI system metrics



Collectors now supports individual scrape intervals

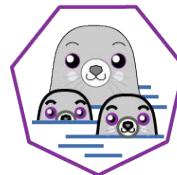


Add support Windows Arm64

Fluent Bit v2.1

Podman Container Metrics

New plugin to collect **metrics** from Podman containers



Fluent Bit v2.1

Metadata support for Logs

No breaking changes :)

BEFORE

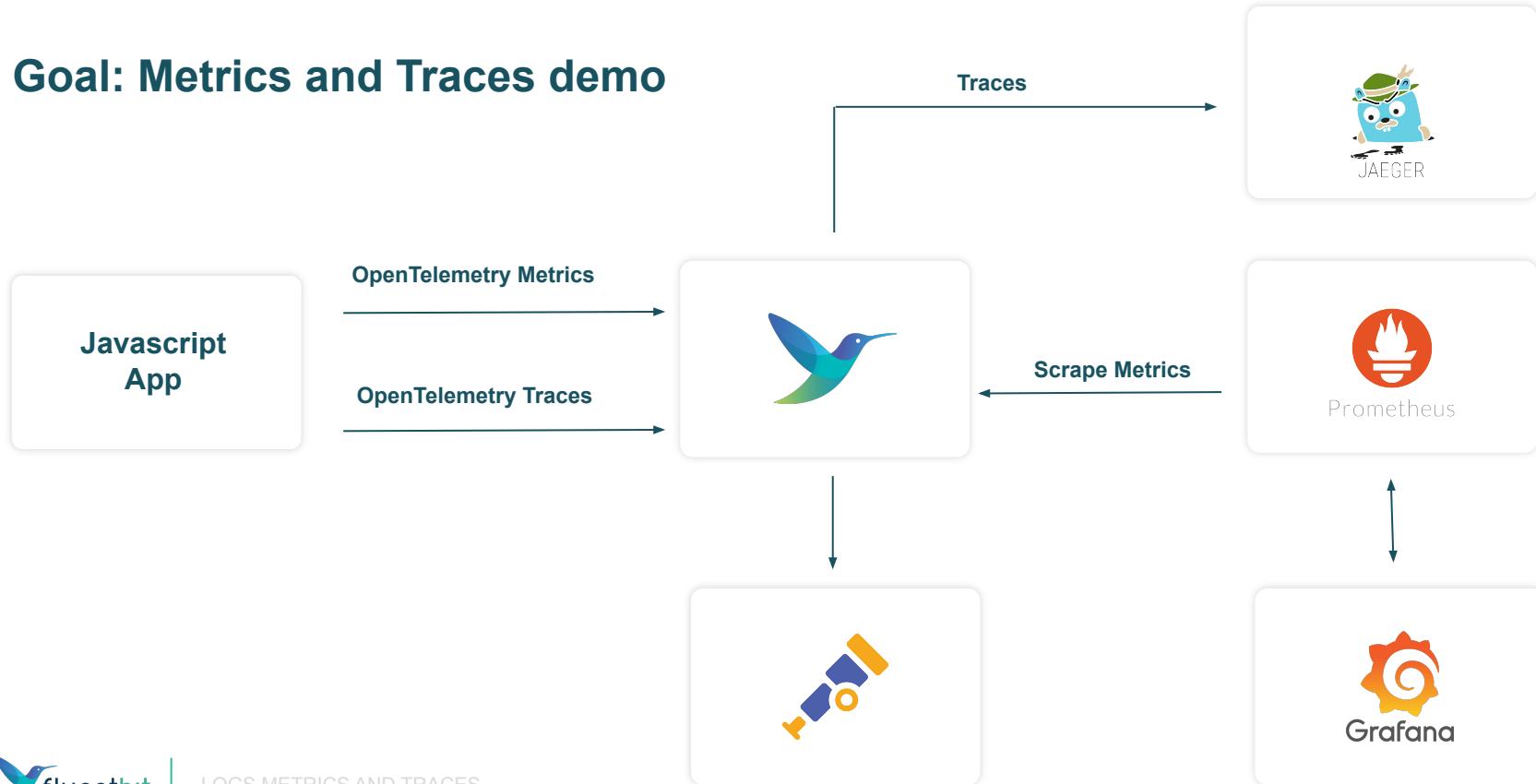
[TIMESTAMP, {EVENT}]

NOW

[[TIMESTAMP, {METADATA}], {EVENT}]

Use Cases

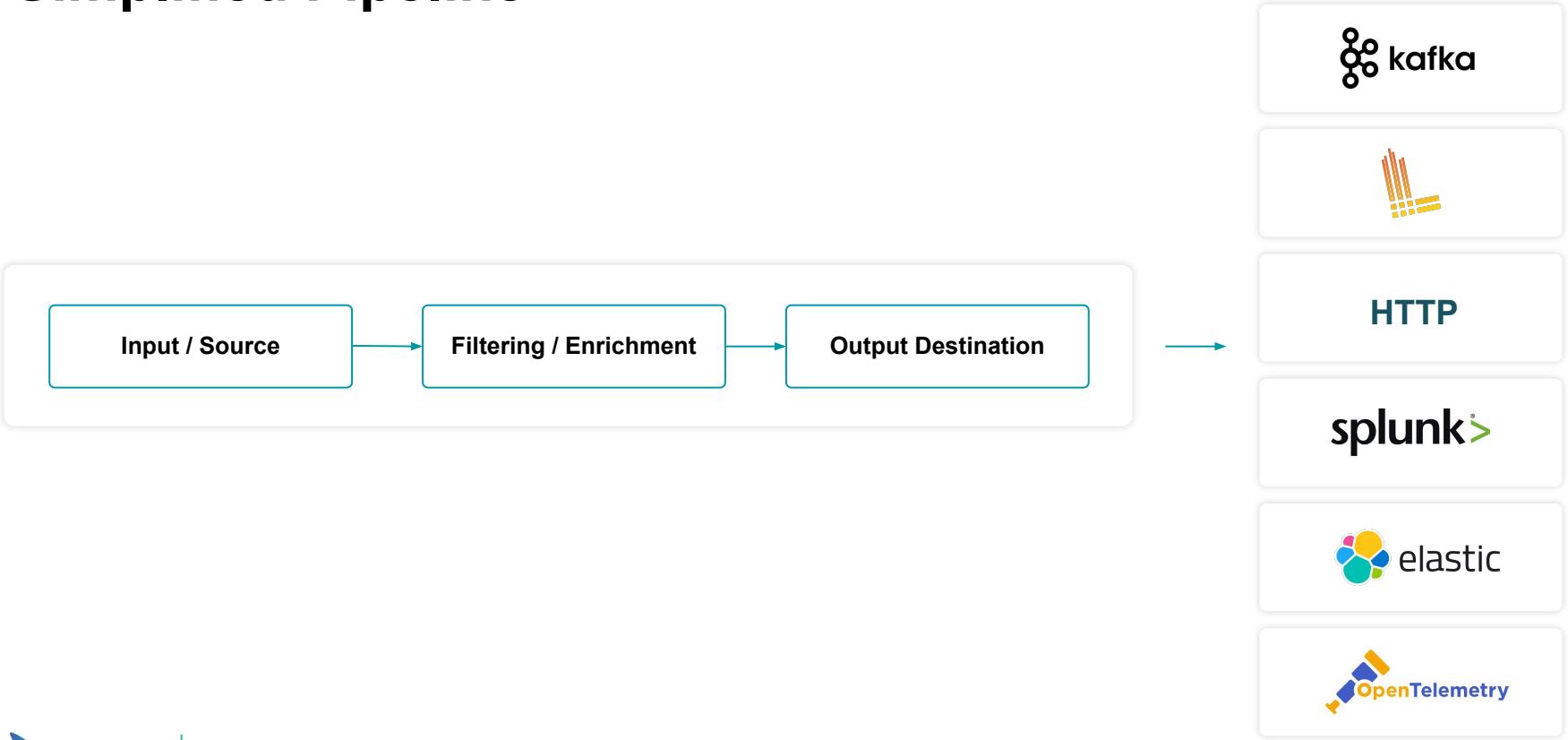
Goal: Metrics and Traces demo



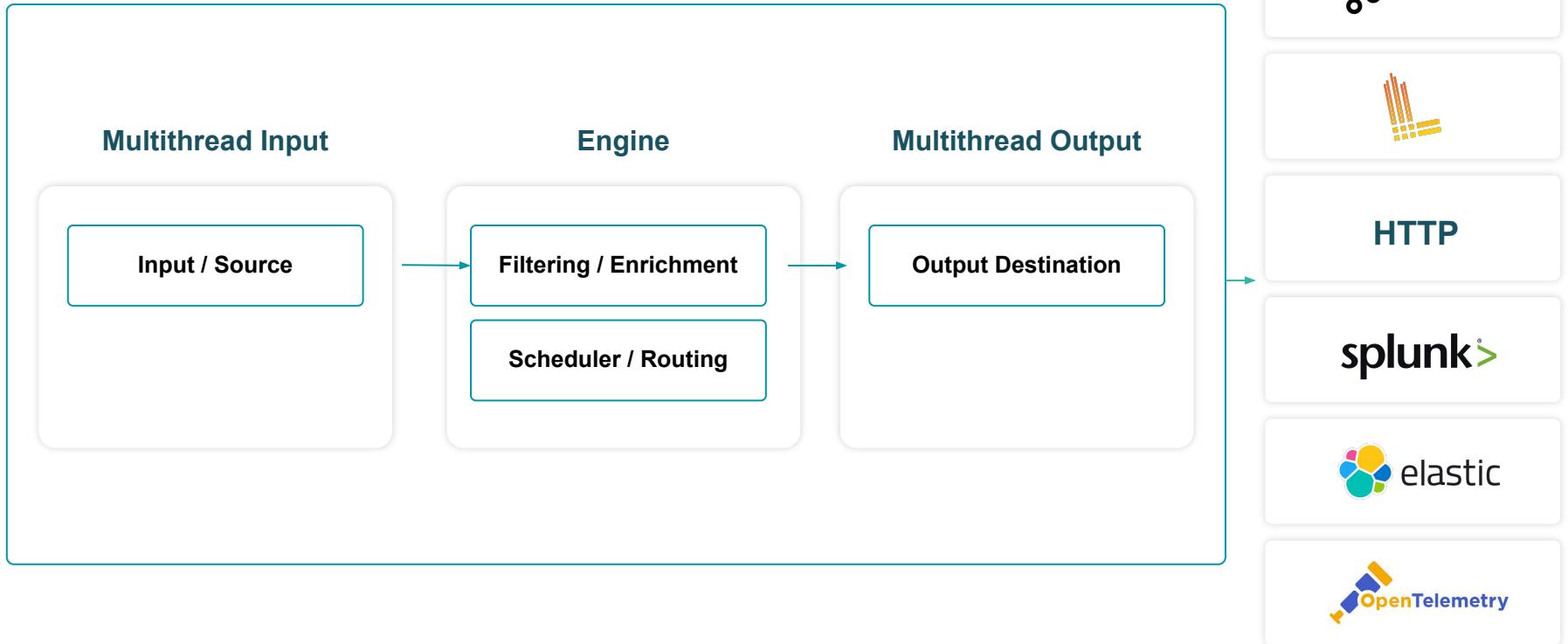


Introducing: Processors

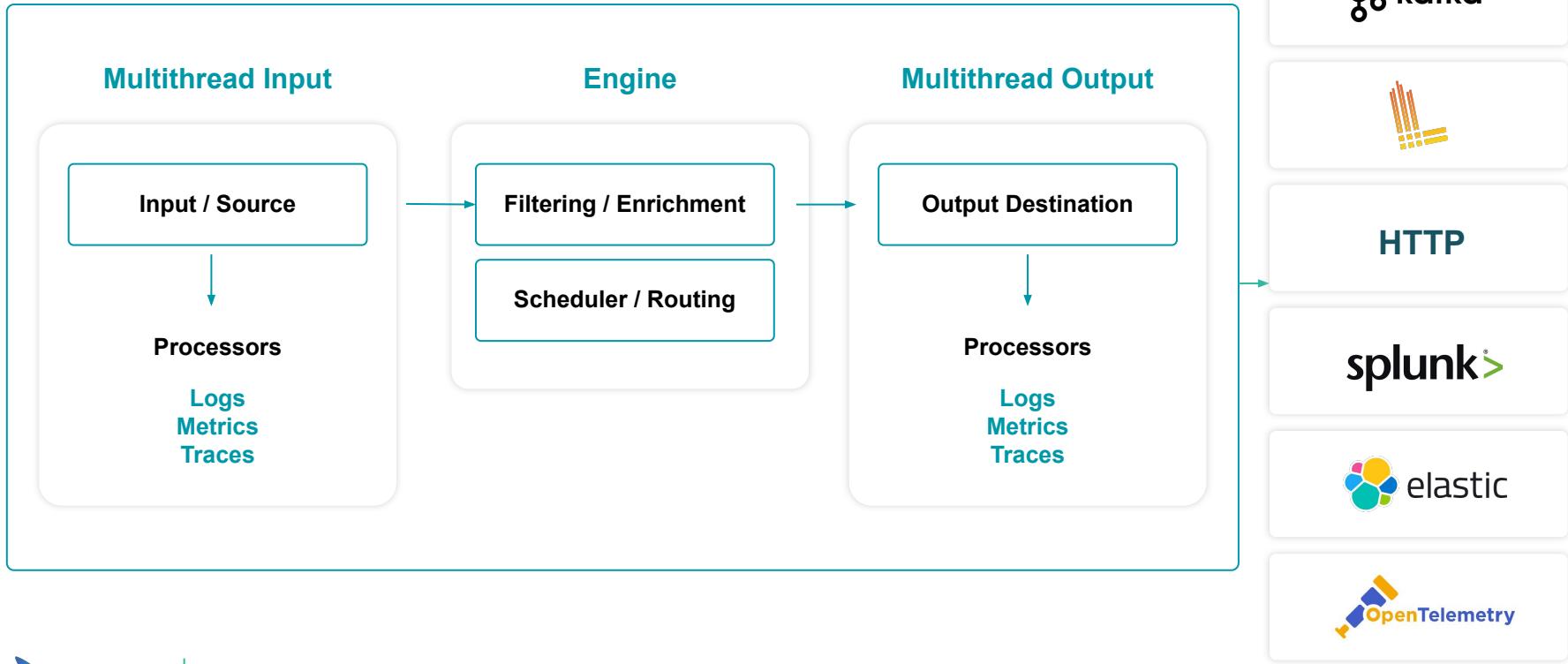
Simplified Pipeline



Multithread Support + Pipeline



Multithread Support + Pipeline + Processors



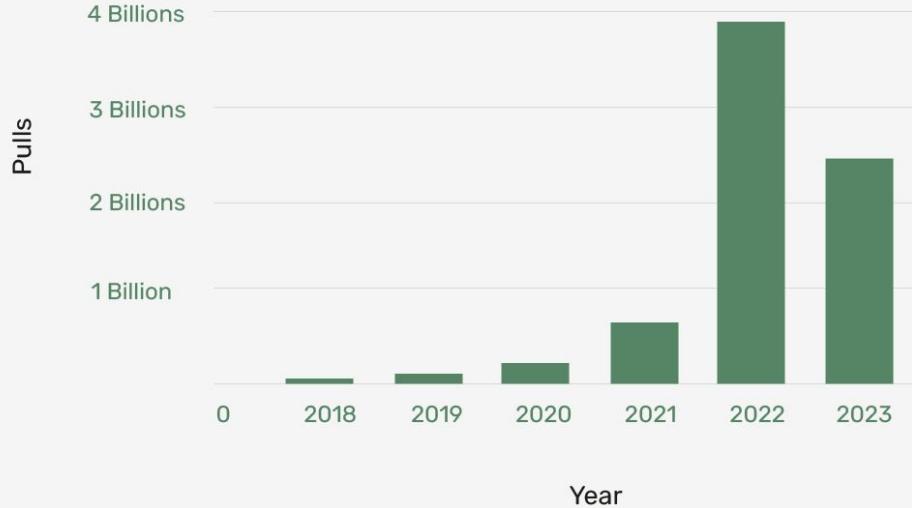
```
service:  
  log_level: info  
  
pipeline:  
  inputs:  
    - name: tail  
      tag: kube.*  
      path: /var/log/containers/*.log  
      multiline.parser: docker, cri  
  
  processors:  
    logs: _____  
      - name: lua  
        call: append_tag  
        code: |  
          function append_tag(tag, timestamp, record)  
            new_record = record  
            new_record["tag"] = tag  
            return 1, timestamp, new_record  
          end  
  
    - name: node_exporter_metrics  
  processors:  
    metrics: _____  
      - name: labels  
        upsert: color blue  
        hash: code  
  
outputs:  
  - name: stdout  
    match: '*'
```

Logs processor: enrich logs with inline Lua Script

Metrics processor: insert or update metrics labels and
'hash' the value of label code.

Stats: Docker Hub Downloads

Pulls vs Year





6.3 Billion downloads

6.3 Billion total! (as of today)



Hands On

Fluent Bit v2.1

Log Metadata Support

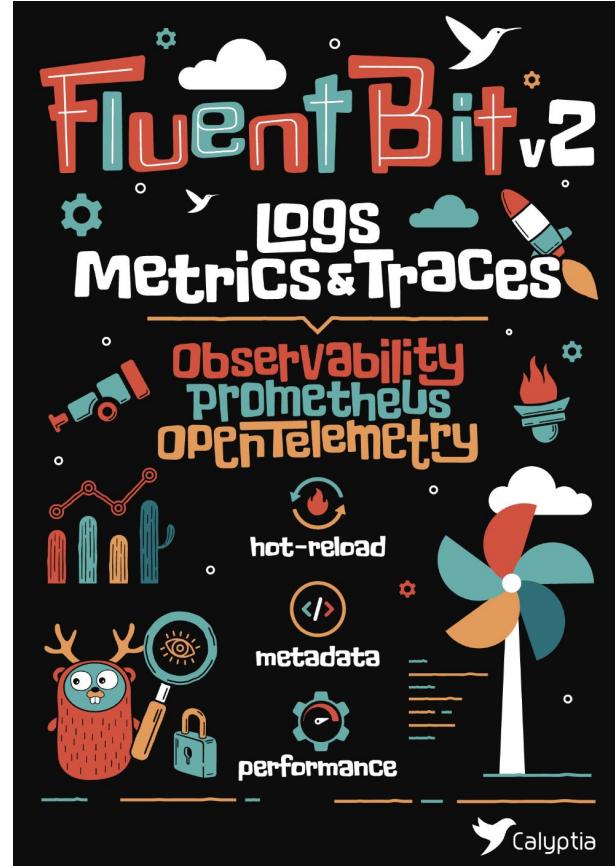
Hot Reload

Performance Improvements

Don't forget to grab your t-shirt !



LOGS METRICS AND TRACES





Thank you!

Eduardo Silva
eduardo@calyptia.com

Anurag Gupta
anurag@calyptia.com

