



Getting Started with Logging in Kubernetes

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TREASURE DATA

- Open Source Software Engineer at Treasure Data
- Maintainer of Fluent Bit (a Fluentd ecosystem project)

#Logging #Kubernetes #Blockchain #Linux #Scalability

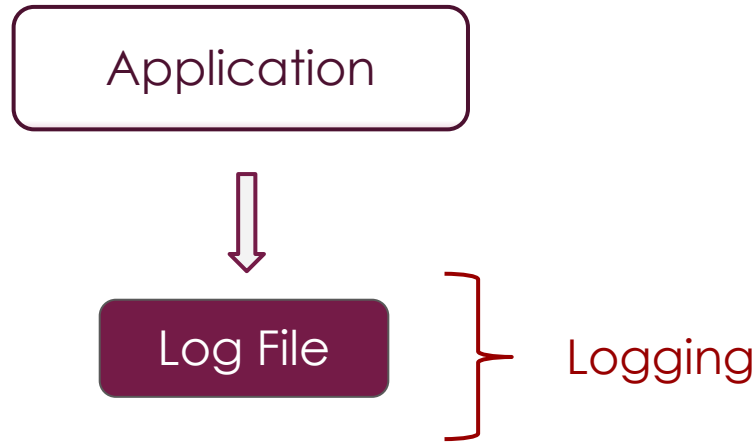




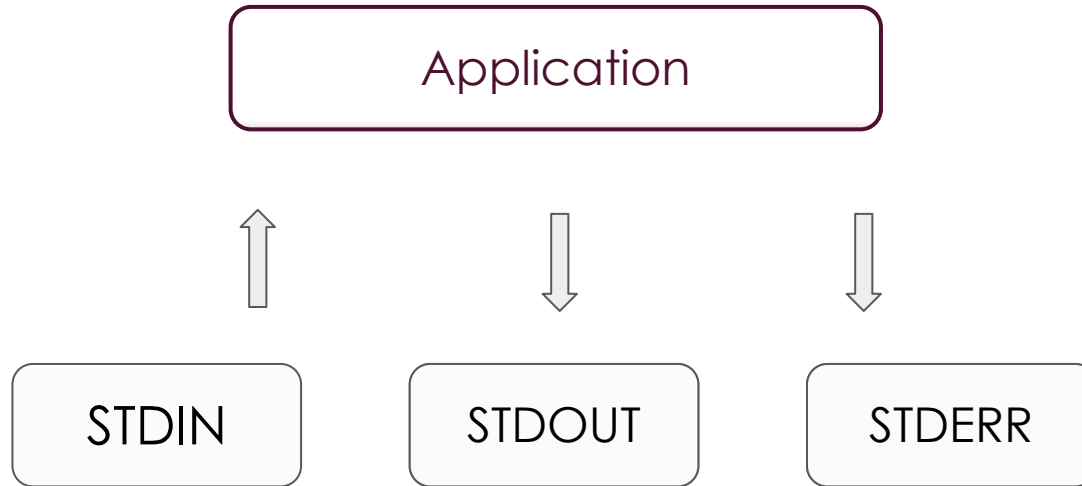
Applications & Logging

Logging / File System

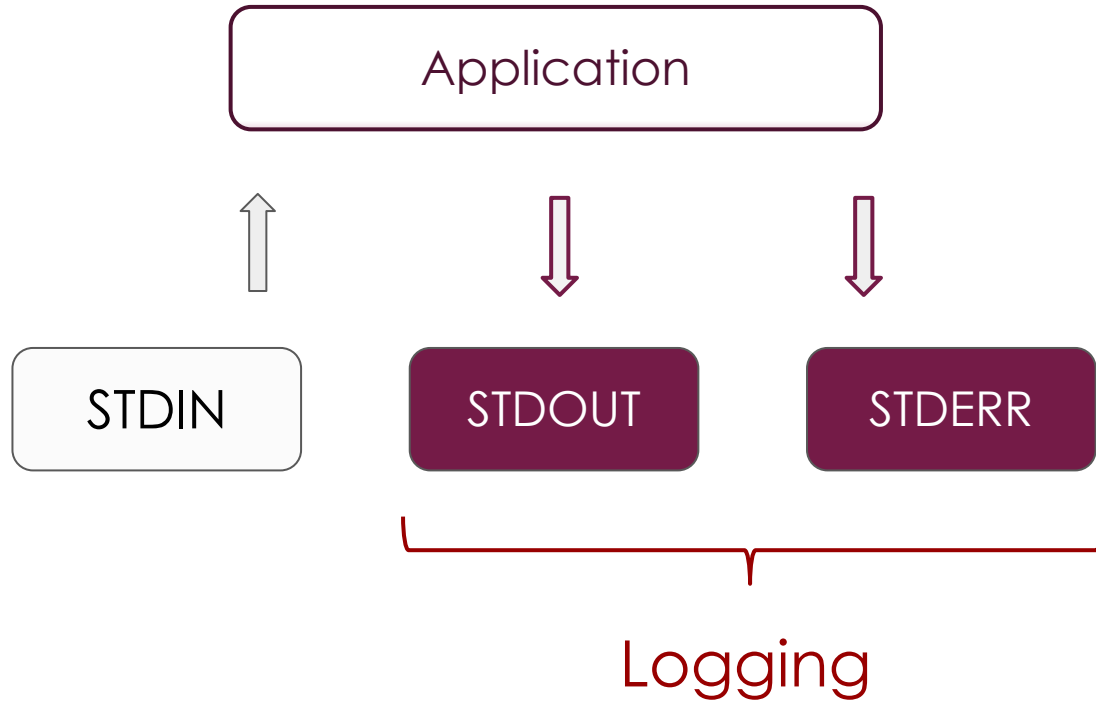
Writing messages to a log file



Standard I/O Streams



Standard I/O Streams



A scenic view of a harbor with colorful buildings and boats, overlaid with a semi-transparent blue and red gradient. The text "Logging & Docker Containers" is centered in white.

Logging & Docker Containers

Logging & Docker Containers

Application writes a message to the standard output interface



Logging & Docker Containers

Message is encapsulated in a JSON Map

By Docker Engine



Hey KubeCon!




```
{  
  "log": "Hej KubeCon!",  
  "stream": "stdout",  
  "time": "2018-04-30T16:16:27.759234297Z"  
}
```

Logging & Docker Containers

JSON Map string is appended to the Container

Log File

`/var/lib/docker/containers/df0ac7aee...48a3d8df/df0ac7aee...48a3d8df-json.log`



```
{  
  "log": "Hej KubeCon!",  
  "stream": "stdout",  
  "time": "2018-04-30T16:16:27.759234297Z"  
}
```

Logging & Docker Containers

Operational perspective

- Discover Containers log files
- Read each log entry = read each JSON Map
- Read content of Log key message
- Append metadata (container name/id)



Demo #1: Docker Log Streams



Applications in Kubernetes (Quick Overview)

Application in Kubernetes

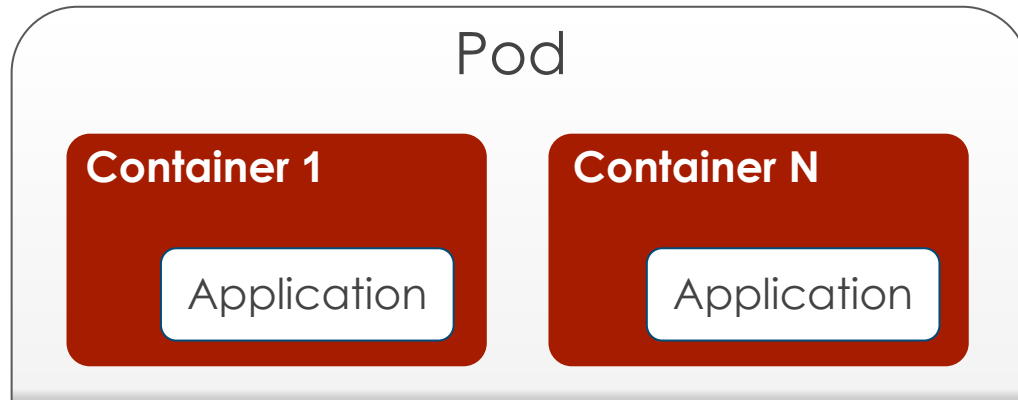
Application

Application in Kubernetes

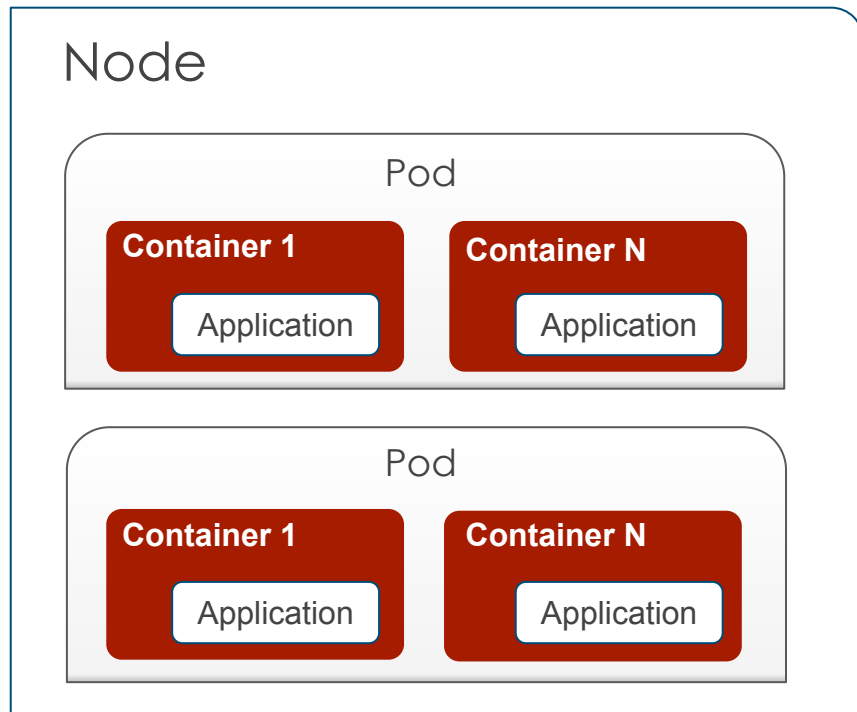
Container

Application

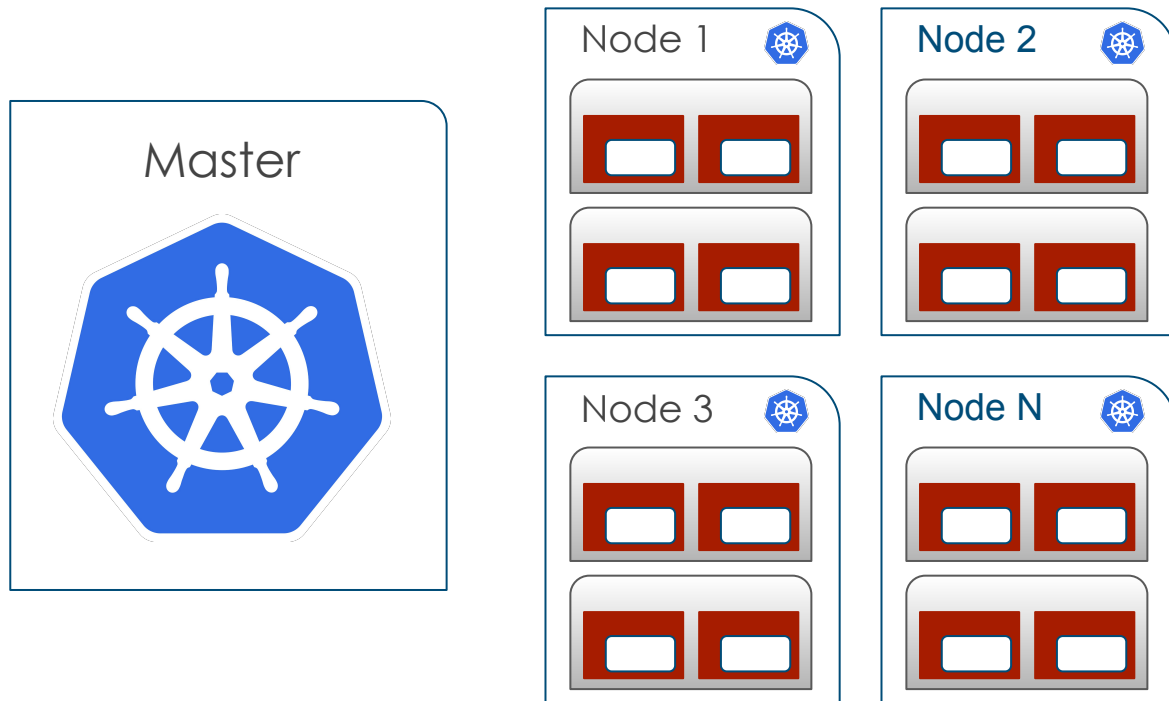
Application in Kubernetes



Application in Kubernetes



Application in Kubernetes





Logging Context in Kubernetes

Logging & Kubernetes

In addition to the container context we have:

- Pod name and Pod ID
- Namespace
- Node (Host)
- Labels
- Annotations

Logging & Kubernetes

Log Processor

Context

- Container name and Container ID
- Pod name and Pod ID
- Namespace
- Node (Host)
- Labels
- Annotations

Logging & Kubernetes

Log Processor

Context

File System / Journald

- Container name and Container ID
- Pod name and Pod ID
- Namespace
- Node (Host)
- Labels
- Annotations

Logging & Kubernetes

Log Processor

Context

File System / Journald

- Container name and Container ID



Kubernetes API Server

- Pod name and Pod ID
- Namespace
- Node (Host)
- Labels
- Annotations

Logging & Kubernetes

Correlate Context

File System / Journald

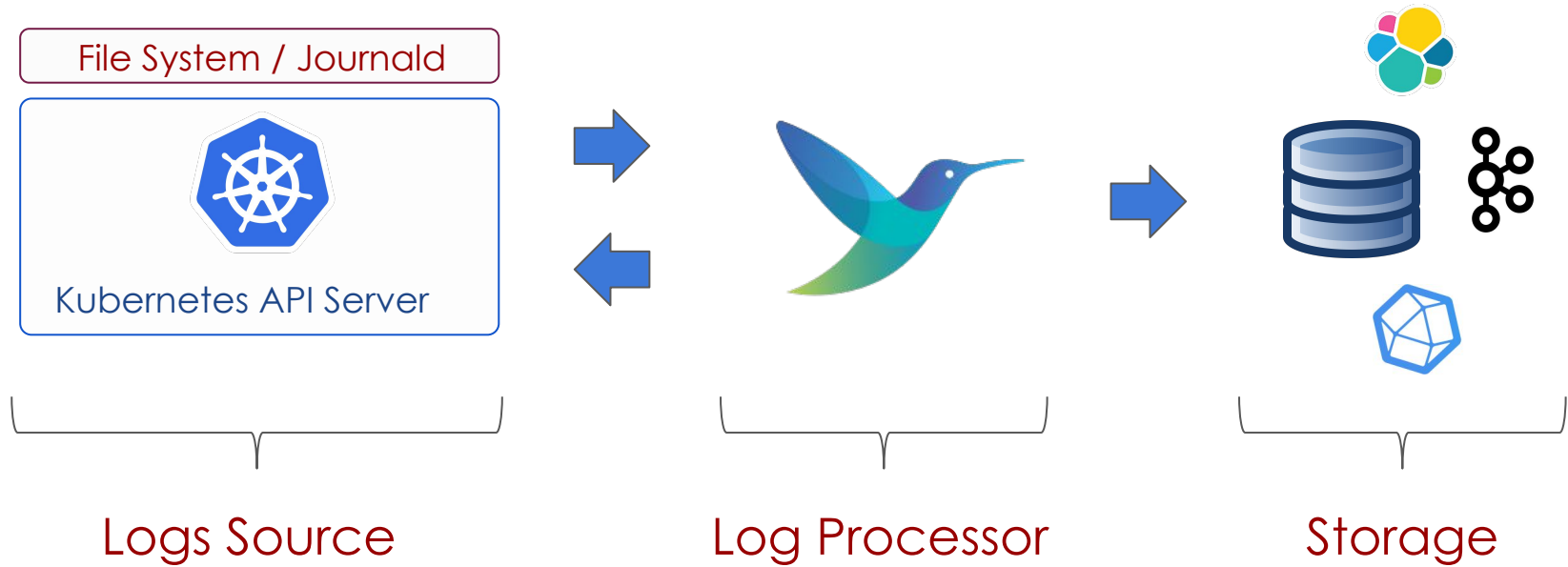


Kubernetes API Server



Log Processor

Logging & Kubernetes

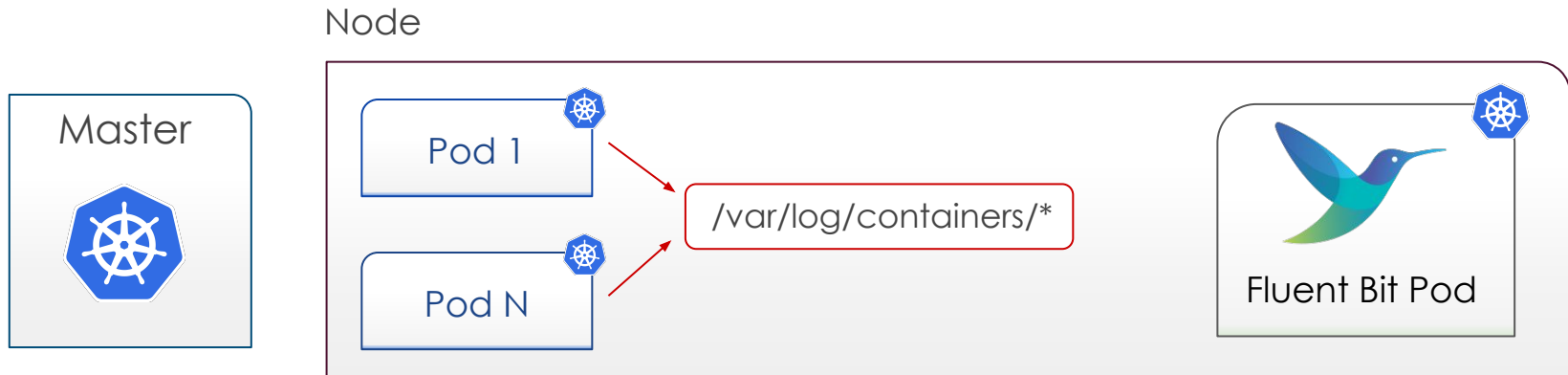




Log Processing in Kubernetes

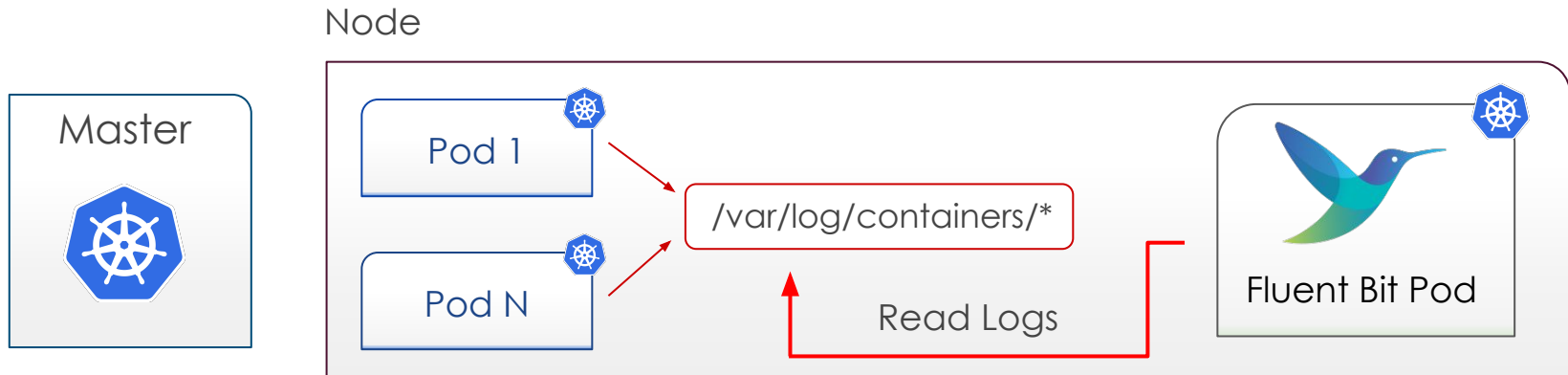
Logging & Kubernetes

Run Log Processor as a DaemonSet



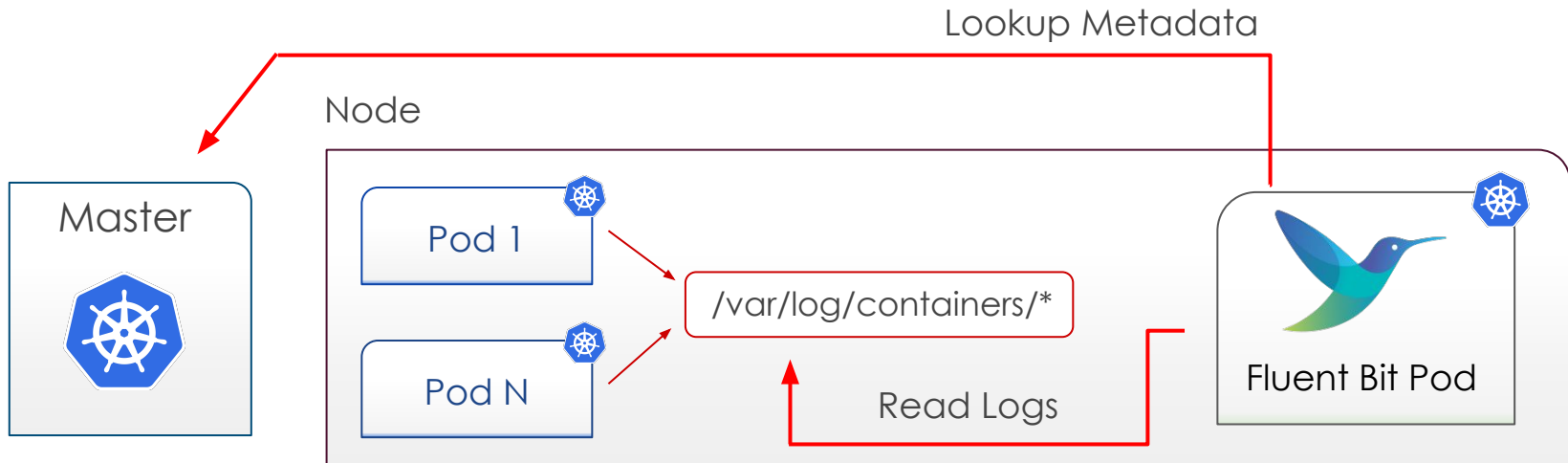
Logging & Kubernetes

Read Logs from the Filesystem (or Journald)



Logging & Kubernetes

Lookup for Metadata Associated with each Pod





Demo #2: Simple Pod and Log Visualization

A scenic view of a harbor, likely in Copenhagen, featuring a row of colorful, multi-story buildings along the waterfront. Several boats are docked in the water. The image is overlaid with a semi-transparent blue and red gradient, with the red being more prominent on the left side. The text "Fluent Ecosystem" is centered in white.

Fluent Ecosystem

Ecosystem



CLOUD NATIVE
COMPUTING FOUNDATION



fluentbit



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fluentbit v0.13

- Annotated Pods
- Metrics: JSON & Prometheus
- Throttle Filter
- Enterprise Connectors



Fluent Bit v0.13

Annotated Pods

- fluentbit.io/parser → suggest a parser
- fluentbit.io/exclude → suggest to exclude logs

Fluent Bit v0.13

Annotated Pods

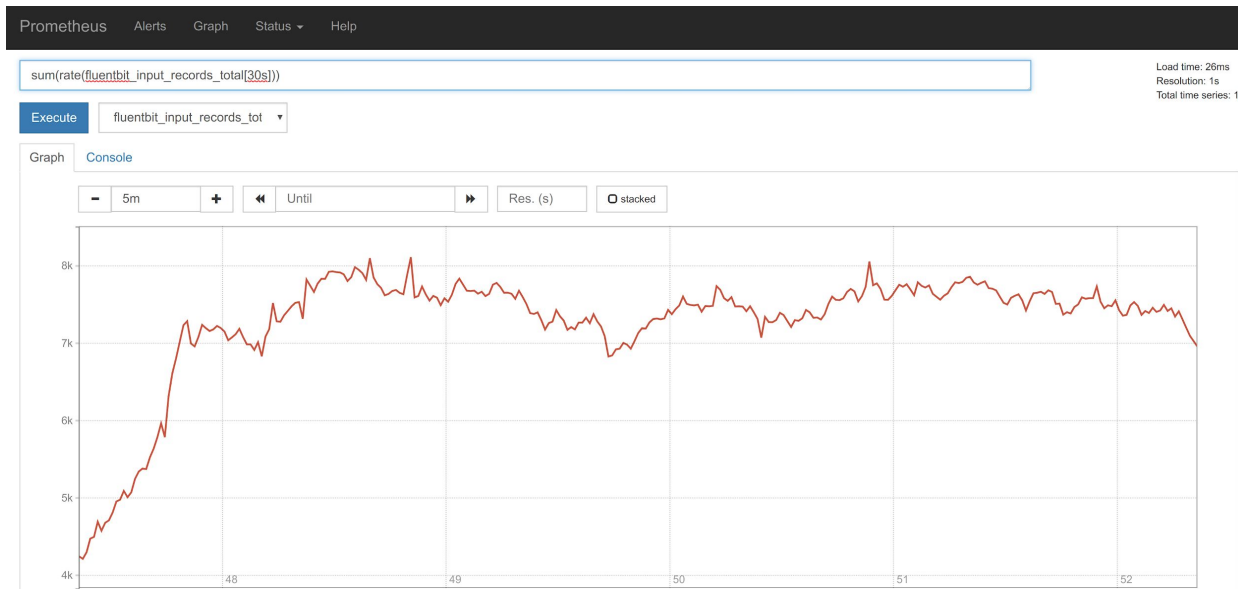
Suggest a Parser



```
apiVersion: v1
kind: Pod
metadata:
  name: apache-logs
  labels:
    app: apache-logs
  annotations:
    fluentbit.io/parser: apache
spec:
  containers:
    - name: apache
      image: edsiper/apache_logs
```

Fluent Bit v0.13

Built-in Metrics (JSON & Prometheus)



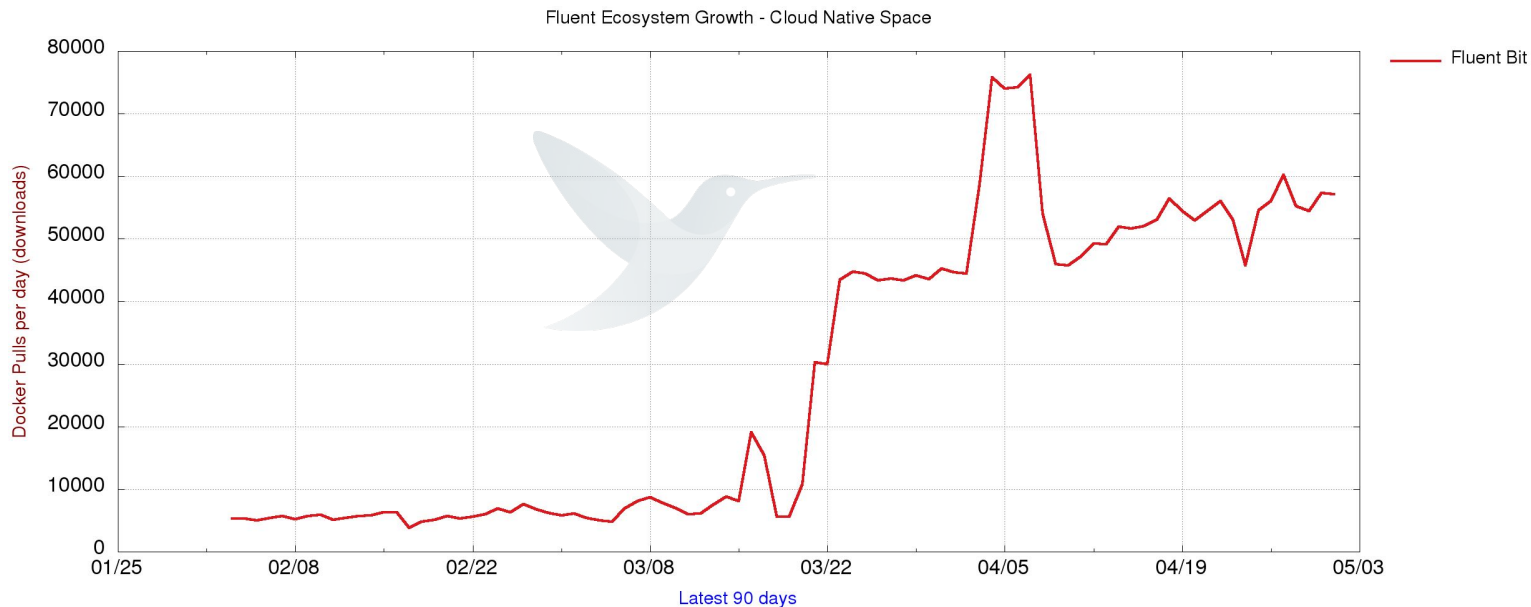
A scenic view of a harbor with colorful buildings and boats, overlaid with a semi-transparent blue and red gradient. The text "Demo #3: Fluent Bit v0.13" is centered in white.

Demo #3: Fluent Bit v0.13

Fluent Bit Status

- **74** Releases
- **32** Contributors in 3 years
- **> 50k** Docker Pulls (downloads) **per day!**
- **> 3M** downloads in the last year

Fluent Bit Adoption (in the last 11 months)



Roadmap / Join us!

We are just starting v0.14 development!

- Features
 - Load Balancing for output plugins
 - Nested Multiline in Docker JSON logs
- We need help with
 - Documentation
 - Unit tests, CI/CD
 - Multiarch Docker images

Getting Started with Logging in Kubernetes

Thanks!

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@edsiper

 fluentbit.io

 [fluent/fluent-bit](https://github.com/fluent/fluent-bit)

