

Kubernetes container platform



Pods

AMIS



Pods and logging



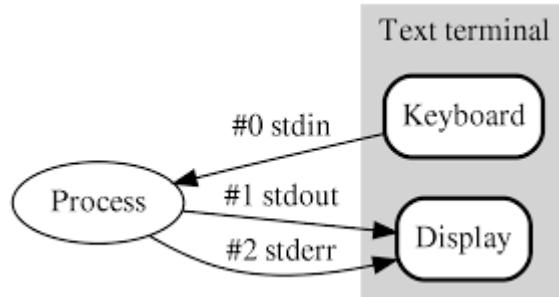
[debug/counter-pod.yaml](#)

```
apiVersion: v1
kind: Pod
metadata:
  name: counter
spec:
  containers:
  - name: count
    image: busybox
    args: [/bin/sh, -c,
           'i=0; while true; do echo "$i: $(date)"; i=$((i+1)); sleep 1; done']
```

```
kubectl create -f https://k8s.io/examples/debug/counter-pod.yaml
pod/counter created
```

```
kubectl logs counter
0: Mon Jan  1 00:00:00 UTC 2001
1: Mon Jan  1 00:00:01 UTC 2001
2: Mon Jan  1 00:00:02 UTC 2001
...
```

stderr and stdout



By default in Kubernetes, Docker is configured to write a container's stdout and stderr to a file under **/var/log/containers** on the host system.

Kubernetes system component logs



There are two types of system components:

- those that run in a container;
 - e.g. Kubernetes scheduler and kube-proxy
- those that do not run in a container
 - e.g. Docker

On machines with systemd, the kubelet and container runtime write to **journald**.
If systemd is not present, they write to .log files in the **/var/log** directory.

System components inside containers always write to the **/var/log** directory, bypassing the default logging mechanism. They use the klog logging library.

Log rotation



Logs consume available storage on the node level !!!!

Kubernetes currently is not responsible for rotating logs

A deployment tool should set up a solution to address that:

- in Kubernetes clusters, deployed by the **kube-up.sh** script, there is a logrotate tool configured to run **each hour (or when size > 100 MB)**
- You can also set up a container runtime to rotate application's logs automatically, e.g. by using Docker's **log-opt**

Cluster level logging



Requirements:

- Separate backend to store, analyze and query logs

Cluster-level logging architectures

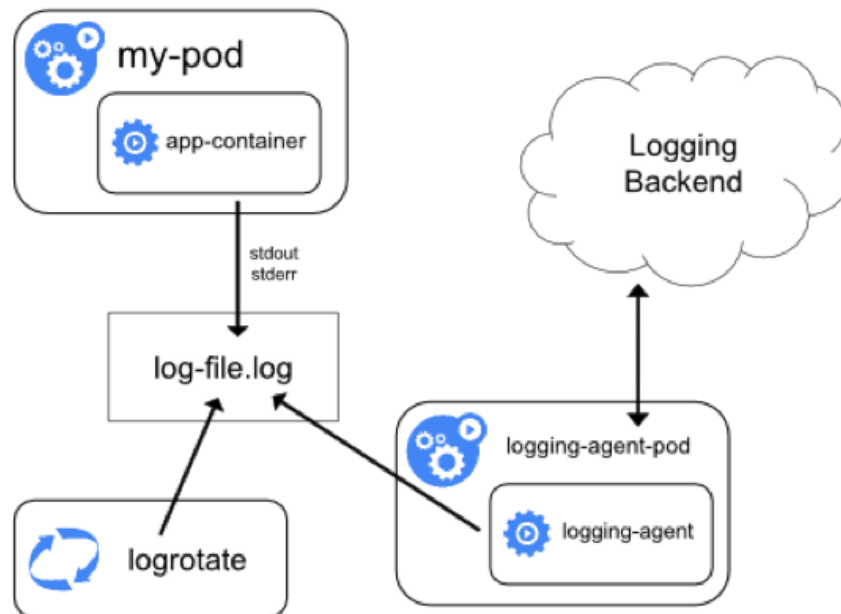


While Kubernetes does not provide a native solution for cluster-level logging

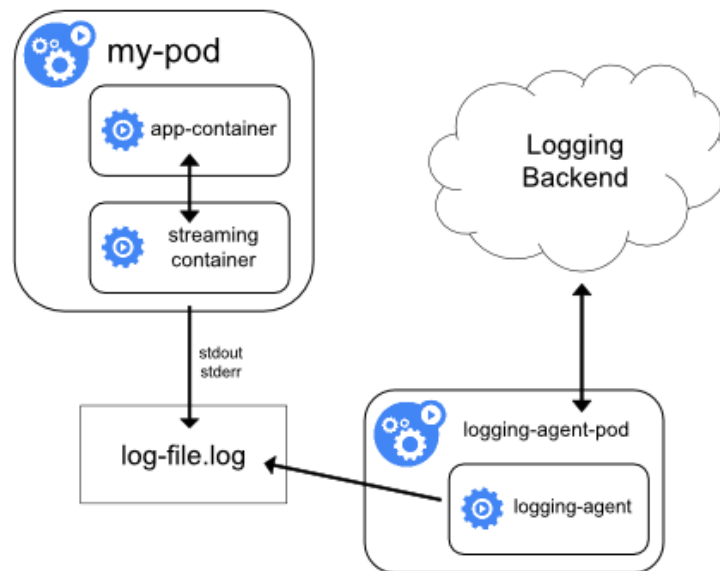
There are several common approaches:

- Use a node-level logging agent that runs on every node;
- Include a dedicated sidecar container for logging in an application pod.
- Push logs directly to a backend from within an application

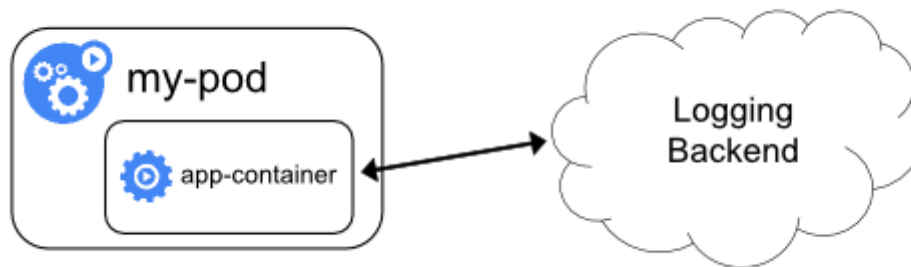
Node logging-agent



Streaming sidecar container



Exposing logs directly from the container



ELK en EFK



Logstash vs Fluentd

	Platform	Event Routing	Plugin Ecosystem	Transport	Performance
Logstash	Mac & Windows	Algorithmic statements	Centralized	Deploy with Redis for reliability.	Uses more memory. Use Elastic Beats for leafs.
Fluentd	Mac & Windows	Tags	Decentralized	Built-in reliability but hard to configure.	Uses less memory. Use Fluent Bit and Fluentd Forwarder for leafs.

Fluentd is also an open source data collector that can collect, parse, transform and analyze data and then store it. It is a project of the Cloud Native Computing Foundation (CNCF) and has a large number of input plugins that can be used to connect with various platforms for accepting data.

Event routing

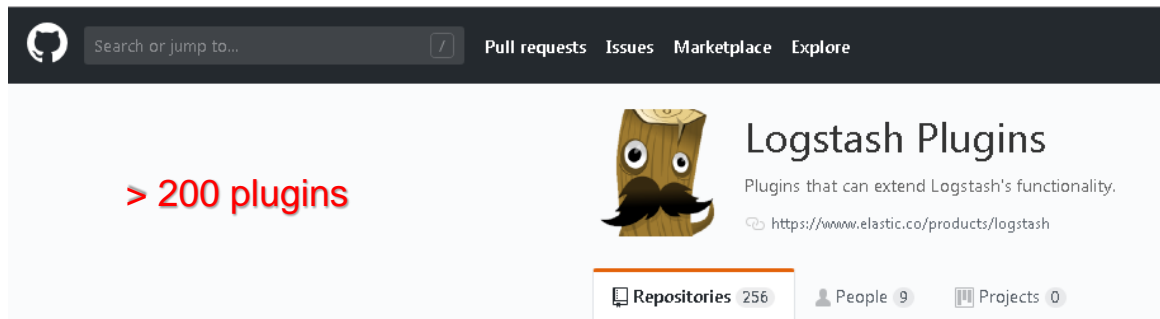


```
1 output {  
2   if [loglevel] == "ERROR" and [deployment] == "production" {  
3     pagerduty {  
4       ...  
5     }  
6   }  
7 }
```




```
1 <match production.error>  
2   type pagerduty  
3   ...  
4 </match>
```

Plugins



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> 200 plugins

 **Logstash Plugins**
Plugins that can extend Logstash's functionality.
<https://www.elastic.co/products/logstash>

Repositories 256 People 9 Projects 0

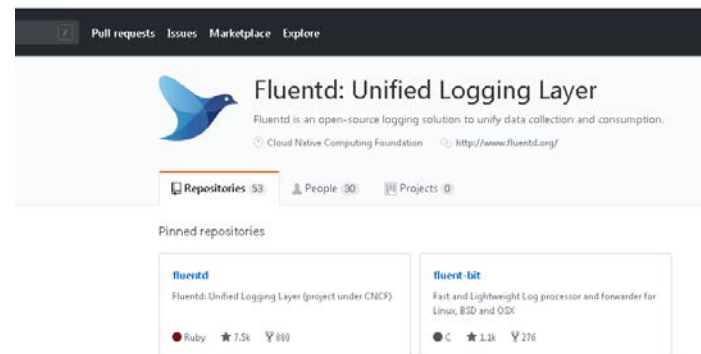


fluentd


Plugins



> 500 plugins



Pull requests Issues Marketplace Explore

 **Fluentd: Unified Logging Layer**
Fluentd is an open-source logging solution to unify data collection and consumption.
Cloud Native Computing Foundation <http://www.fluentd.org/>

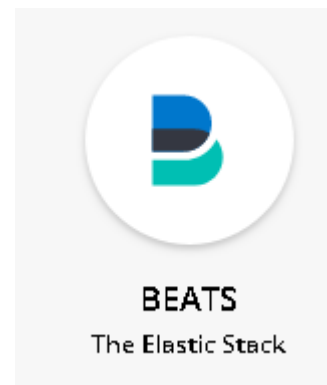
Repositories 53 People 90 Projects 0

Pinned repositories

fluentd Fluentd: Unified Logging Layer (project under CNCF) Ruby ★ 7.5k ¥ 880	fluent-bit Fast and Lightweight Log processor and forwarder for Linux, BSD and OSX C ★ 1.1k ¥ 276
--	--

10 official plugins

Lightweight log processor + forwarder



Coming up



<https://github.com/AMIS-Services/sig-kubernetes/tree/master/SIG02-logging>