Selecting the right container logging solution for your application
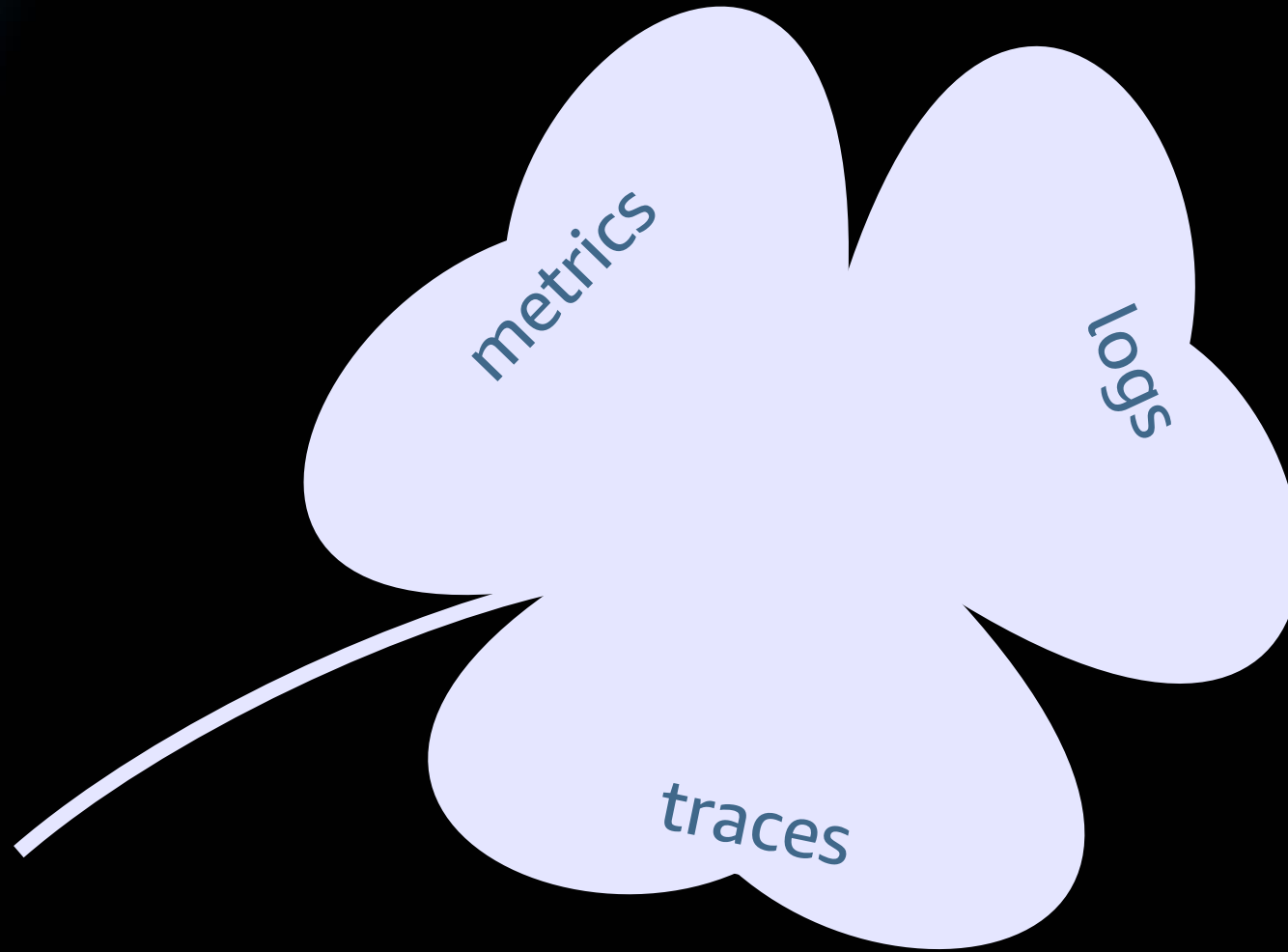
Ashwin Ram

Startup Solutions Architect
Amazon Web Services

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The observability shamrock

What is logging and why you *should* pay attention?

Various container logging options

Logging driver

Using awslogs log driver

- You can configure the containers to send log information to Amazon CloudWatch Logs

- Supported platforms:
  - Amazon Elastic Container Service (Amazon ECS)
  - AWS Batch
  - AWS Fargate

- awslogs log driver shows the result of the container command output (the STDOUT and STDERR I/O streams)

- It outputs to Amazon CloudWatch Logs and can be configured for a specific log group in that account

Using awslogs log driver

- The easiest way to handle container logs in AWS

- Allows you to view the logs from your containers

- Prevents your container logs from taking up disk space on your container instances

- Amazon CloudWatch Logs Insights can interactively search and analyze your log data

Things to consider...

The awslogs log driver simply passes logs from Docker to Amazon CloudWatch Logs

Backpressure

Consider the awslogs driver configuration carefully (non-blocking mode)

When choosing between these drivers, consider your use case, specifically whether all logs must be retained in all circumstances

Other log driver options

- Containers may use a different logging driver than the Docker daemon, by specifying a log driver configuration in the container definition.

- For tasks on AWS Fargate, the supported log drivers are awslogs, splunk, and awsfirelens.

- For tasks hosted on Amazon EC2 instances, the supported log drivers are awslogs, fluentd, json-file, journald, logentries, gelf, syslog, splunk, and awsfirelens.

- Additional log drivers may be available in future releases of the Amazon ECS container agent.

Logging via an agent

Amazon Cloudwatch agent for logging

- Amazon CloudWatch Agent can be configured to forward specific log files on your container host

- Supported platforms:
  - Own container orchestration on Amazon EC2
  - On-premises servers
  - Amazon Elastic Container Service (Amazon ECS)
  - Amazon Elastic Kubernetes Service (Amazon EKS)
  - Kubernetes platforms on Amazon EC2 instances

- Commonly used for log rotation of containers or moving logs from storage in hosts

- Particularly useful for hybrid cloud workloads or if you are looking for similar solutions

Logging via FluentD and Fluent Bit

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FluentD and Fluent Bit

- Open source and multi-platform log processors and forwarders

- A dilemma many developers have traditionally faced is: **what to log and what not to**?

  - Using cost-efficient and durable storage - Amazon Simple Storage Service (Amazon S3)
  - On demand as-is analysis at scale - Amazon Athena and Amazon Redshift Spectrum

- AWS For Fluent Bit is a container image pre-installed with plugins

  Helps customers route logs to multiple destinations – Amazon CloudWatch, Amazon Simple Storage Service (Amazon S3), Amazon Redshift, and Amazon OpenSearch

Containers

Analyze Kubernetes container logs using Amazon S3 and Amazon Athena

by Re Alvarez-Parmar and Vikram Venkataraman | on 20 NOV 2020 | in Containers | Permalink | ➤ Share

https://aws.amazon.com/blogs/containers/analyze-kubernetes-container-logs-using-amazon-s3-and-amazon-athena

Through Amazon Cloudwatch Container Insights

- Container Insights collect, aggregate, and summarize metrics and logs

- Collects data as performance log events using embedded metric format

- Can also leverage FluentD and Fluent Bit as a DaemonSet to provide logs and metrics

- Supported platforms:
  - Amazon ECS
  - Amazon EKS
  - Kubernetes platforms on Amazon EC2
  - Amazon ECS – AWS Fargate

Containers

Fluent Bit Integration in CloudWatch Container Insights for EKS

by Ugur KIRA | on 26 JAN 2021 | in Amazon Elastic Kubernetes Service, AWS Fargate, Containers | Permalink | ↱ Share

https://aws.amazon.com/blogs/containers/fluent-bit-integration-in-cloudwatch-container-insights-for-eks/

Persistent storage for container logging using Fluent Bit and Amazon EFS

- Containerized applications logs to standard output and can be redirected to local ephemeral storage

- Logs are lost when the containers are terminated

- Recommended for use cases, where there is a need to persist logs to a storage, before sending it to other logging solutions/destinations

Persistent storage for container logging using Fluent Bit and Amazon EFS

by Shrinath Kurdekar | on 23 NOV 2020 | in Advanced (300), Amazon Elastic File System (EFS), Amazon Elastic Kubernetes Service, AWS Fargate, Containers, Expert (400), Storage, Technical How-To | Permalink | 💬 Comments | ↱ Share

https://aws.amazon.com/blogs/storage/persistent-storage-for-container-logging-using-fluent-bit-and-amazon-efs/

FireLens

FireLens

- FireLens makes it easy to use the popular open source logging projects Fluentd and Fluent Bit

- Fluent Bit is our recommendation because of effective resource utilization

AWS Open Source Blog

Centralized Container Logging with Fluent Bit

Efficiency comparison Fluent Bit vs FluentD: https://aws.amazon.com/blogs/opensource/centralized-container-logging-fluent-bit/

AWS News Blog

Announcing Firelens – A New Way to Manage Container Logs

by Martin Beeby | on 18 NOV 2019 | in Containers, Launch, News | Permalink | ➤ Share

https://aws.amazon.com/blogs/aws/announcing-firelens-a-new-way-to-manage-container-logs/

Why not Fluentd and Fluent Bit? Why FireLens?

- Powerful, but large feature sets are always accompanied by complexity

- When we designed FireLens, we envisioned two major segments of users:

    - Those who want a simple way to send logs anywhere

    - Those who want the full power of Fluentd and Fluent Bit, with AWS managing the undifferentiated labor

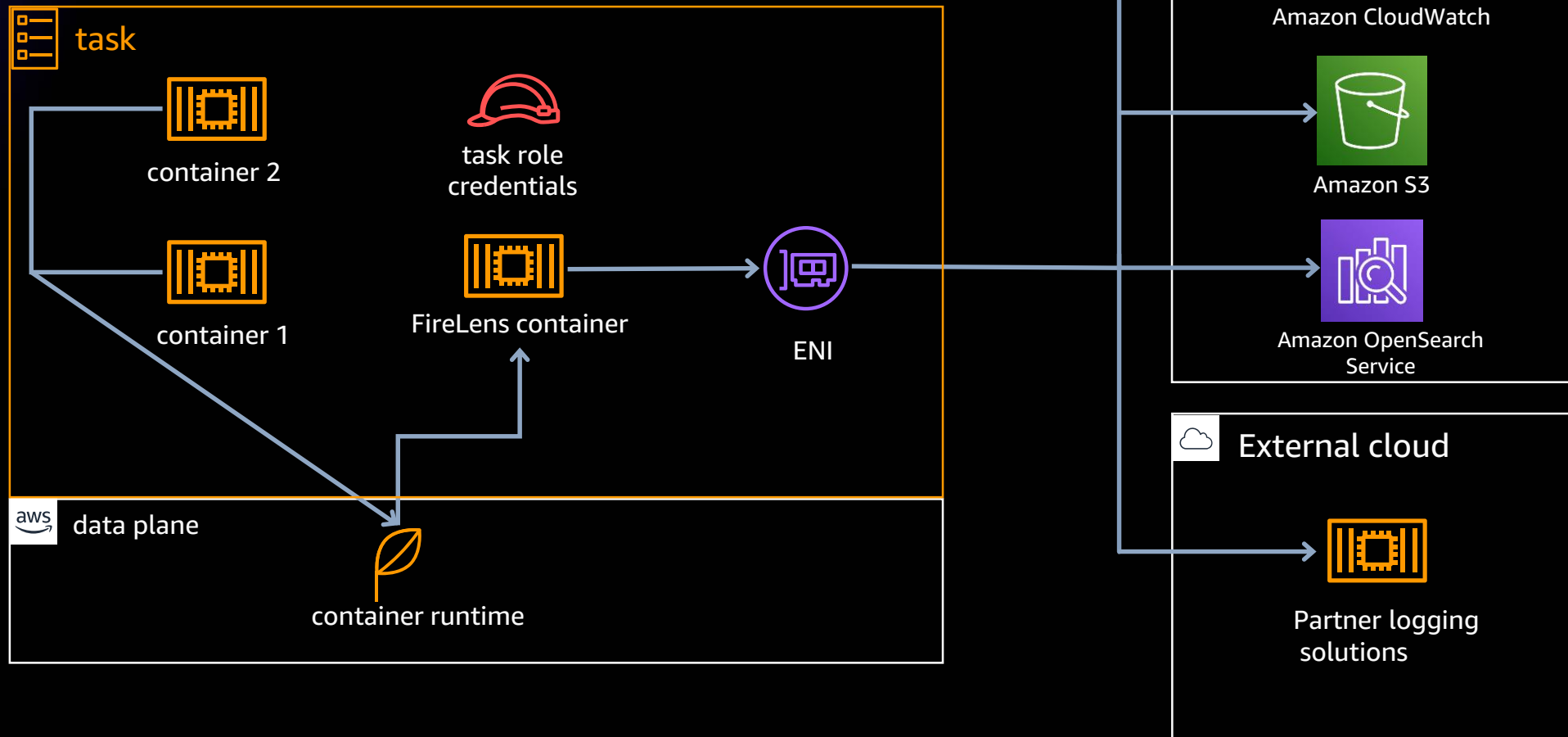**Under the hood: FireLens for Amazon ECS Tasks**
by Wesley Pettit | on 18 NOV 2019 | in Advanced (300), Amazon Athena, Amazon CloudWatch, Amazon EC2, Amazon Elastic Container Service, Amazon Kinesis, Amazon OpenSearch Service (Successor To Amazon Elasticsearch Service), Amazon Simple Storage Services (S3), AWS Fargate, Containers | Permalink | 💬 Comments | ↱ Share

https://aws.amazon.com/blogs/containers/under-the-hood-firelens-for-amazon-ecs-tasks/
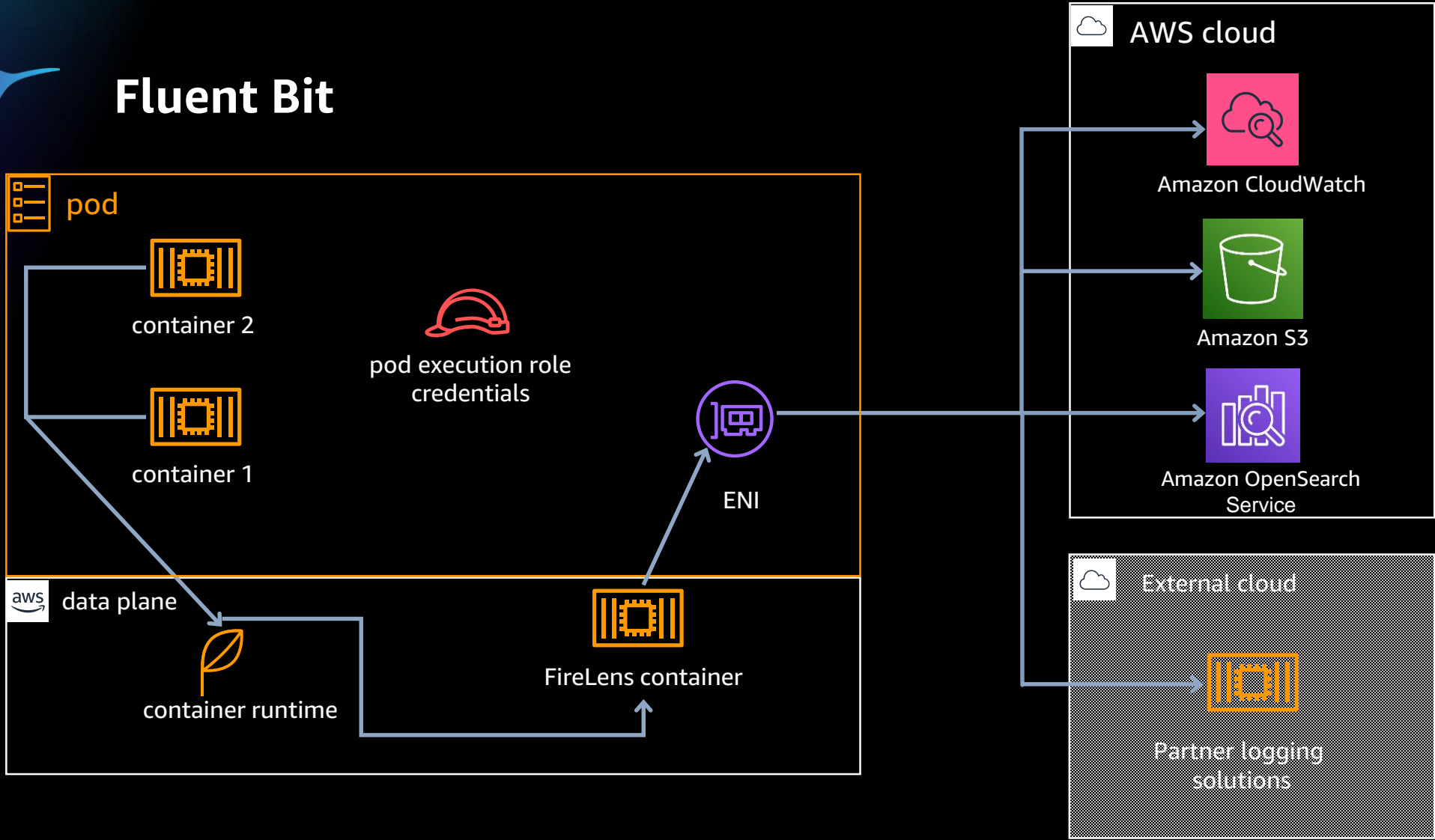
FireLens for ECS

Fluent Bit

FireLens for EKS

Fluent Bit

pod

container 2

container 1

pod execution role credentials

ENI

data plane

container runtime

FireLens container

AWS cloud

Amazon CloudWatch

Amazon S3

Amazon OpenSearch Service

External cloud

Partner logging solutions

Demo time!

aws

Recap and other resources

1. [Choosing container logging options to avoid backpressure](#)

2. [Analyze Kubernetes container logs using Amazon S3 and Amazon Athena](#)

3. [Fluent Bit integration in Amazon CloudWatch Container Insights for Amazon EKS](#)

4. [Persistent storage for container logging using Fluent Bit and Amazon EFS](#)

5. [Centralized container logging with Fluent Bit](#)

6. [Deploy FluentBit on Amazon EKS: Tutorial](#)

7. [Under the hood: FireLens for Amazon ECS tasks](#)

8. [aws-samples/amazon-ecs-firelens-examples](#)

9. [Fluent Bit for Amazon EKS on AWS Fargate is here](#)

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Visit the Modern Applications Resource Hub for more resources

Dive deeper with these resources to help you develop an effective plan for your modernization journey.

- Build modern applications on AWS e-book
- Build mobile and web apps faster e-book
- Modernize today with containers on AWS e-book
- Adopting a modern Dev+Ops model e-book
- Modern apps need modern ops e-book
- Determining the total cost of ownership: Comparing Serverless and Server-based technologies paper
- Continuous learning, continuous modernization e-book
- … and more!

https://bit.ly/3yfOvbK

Visit resource hub »

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Thank you!