STEP ON IT!

Rapid Event-Based AWS Cost Control

With Step Functions

Damien Jones (he/him)

AWS Consultant @ Steamhaus

2025-04-24 London DevOps

aws

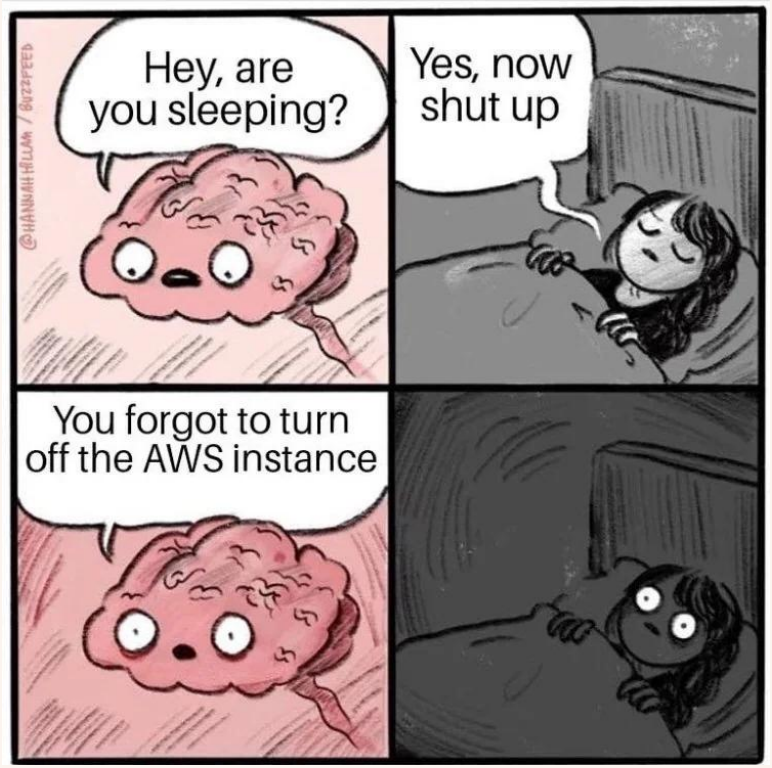
aws
aws

aws
aws
aws

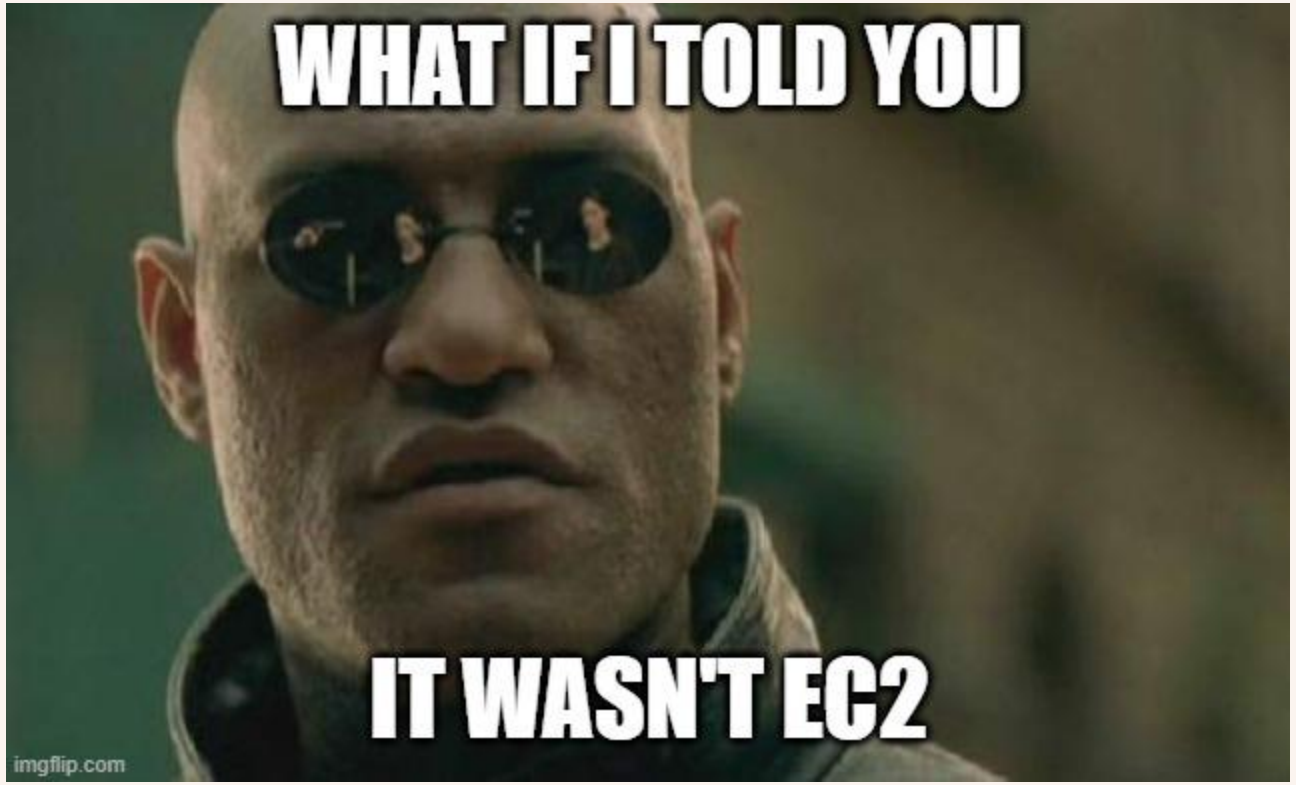
MY AWS ACCOUNT

MY BILL

LOL ROFL LMAO ETC

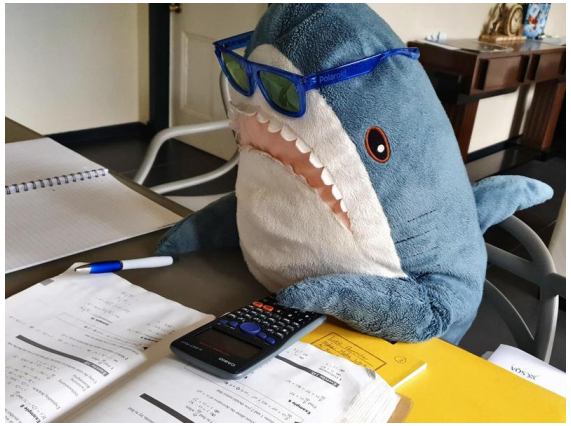


NOPE



AGENDA

WHY DID THIS HAPPEN?



WHAT DID I DO?

HOW DID I BUILD IT?

BUT FIRST

Hi.

Steamhaus

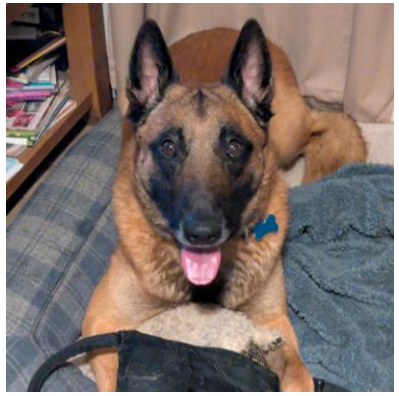
AWS Consultant

Steamhaus UK

Content Creator

amazonwebshark.com

aws certified



AWS Certified

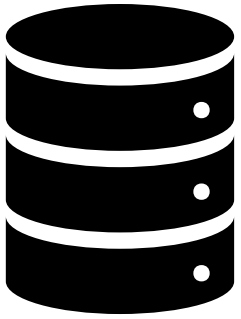
x3

Dog Dad

to this noodle

AWS User Group Leader

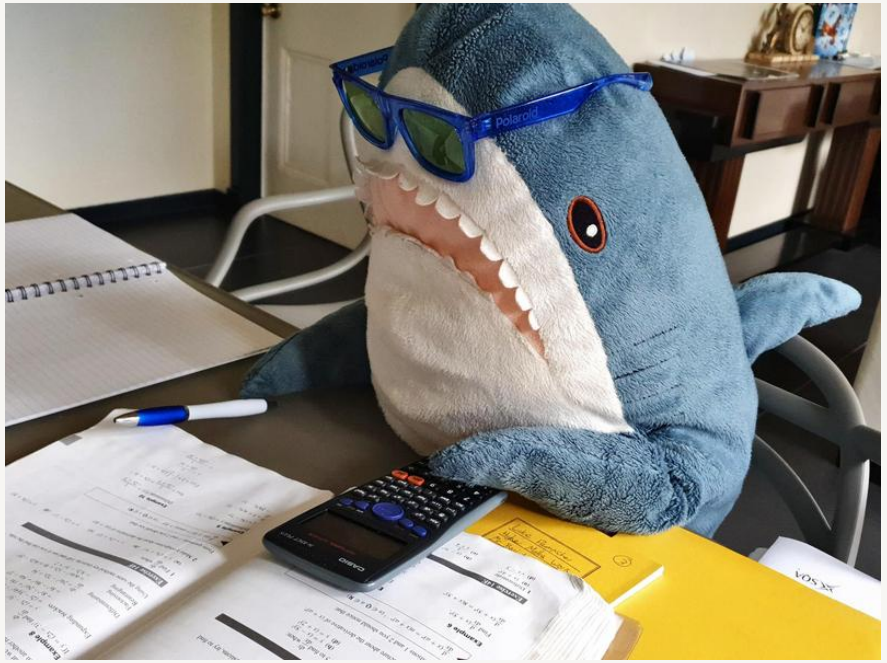
Lancashire UK



AWS Community Builder

Data Category

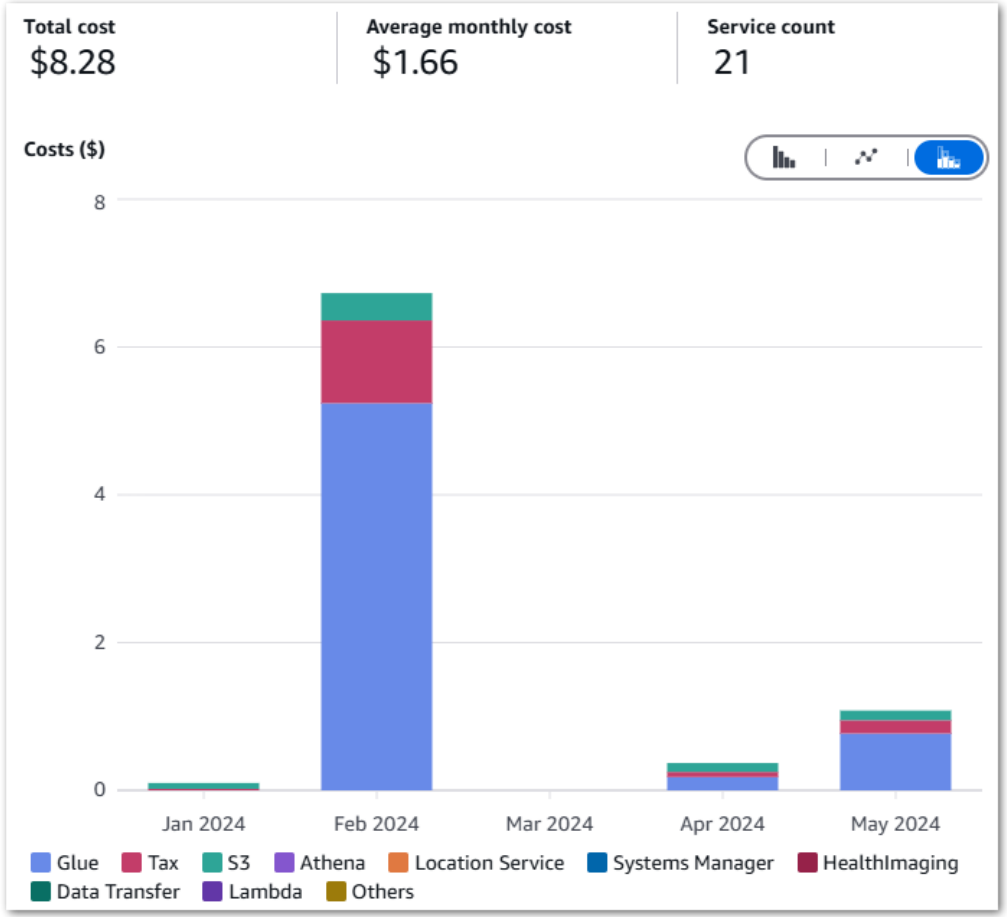
WHY DID THIS HAPPEN?



AWS GLUE

COSTS: 2024 JUNE

COSTS: 2024 H1



COSTS: 2024 JUNE

COST & USAGE: API OPERATION

COST & USAGE: API OPERATION – TAX

COST: API OPERATION – GLUE JOB RUN

COST: API OPERATION – GLUE INTERACTIVE SESSION

COST & USAGE: API OPERATIONS

API operation	API operation total	Jun-01*	Jun-02*	Jun-03*
Total costs	$2.63	$0.75	$0.90	$0.99
GlueInteractiveSession	$1.50	-	$0.54	$0.97
No operation	$0.72	$0.72	-	-
Jobrun	$0.33	-	$0.33	-
CrawlerRun	$0.06	$0.02	$0.02	$0.02
PutObject	$0.01	$0.00	$0.00	$0.00
ListBucket	$0.00	$0.00	$0.00	$0.00
ReadACL	$0.00	$0.00	$0.00	$0.00

COST & USAGE: API OPERATIONS

API operation	API operation total	Jun-01*	Jun-02*	Jun-03*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GlueInteractiveSession	$1.50	-	$0.54	$0.97
No operation	$0.72	$0.72	-	-
Jobrun	$0.33	-	$0.33	-
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

WHAT'S AN INTERACTIVE SESSION?

00:00:00

AWS Glue | eu-west-1

eu-west-1.console [redacted]

Search [Alt+S]

AWS Glue

Getting started
ETL jobs
- Visual ETL
- Notebooks
- Job run monitoring

Data Catalog tables
Data connections
Workflows (orchestration)
Zero-ETL integrations New

Data Catalog
Databases
- Tables

Stream schema registries
- Schemas

Connections
Crawlers
- Classifiers

Catalog settings

Data Integration and ETL
Zero-ETL integrations New
ETL jobs
- Visual ETL
- Notebooks
- Job run monitoring

Interactive Sessions
Data classification tools
- Sensitive data detection
- Record Matching

Triggers
Workflows (orchestration)
- Blueprints

Security configurations
Cost management New

Legacy pages
Connections (legacy)
Jobs (legacy)

Welcome to AWS Glue

Get started by setting up your account and users, cataloging your data, and building ETL jobs to prepare data for analytics.

Prepare your account for AWS Glue

Admins: Grant access to AWS Glue and **set a default IAM role.**

Set up roles and users

Catalog and search for datasets

View your databases & tables and catalog data using Crawlers.

Go to the Data Catalog

Move and transform data Updated

Use Zero-ETL integrations to replicate data in near real-time, or ETL jobs to transform data in visual, notebook, or code interface.

Go to Zero-ETL integrations | Go to ETL jobs

Resources and tutorials

Getting started with AWS Glue: DocumentationAWS Training

Glue in 5 Minutes Videos: Authoring, GenAI, Monitoring, Orchestration

Using connectors and connections

AWS Glue Documentation home

Examples: AWS Glue blog postsAWS Glue on GitHub

What's new in Glue

Announcing support of AWS Glue Data Catalog views with AWS Glue 5.0	Mar 14, 2025
AWS Glue now available in two new regions	Mar 12, 2025
AWS Glue expands connectivity to 14 native connectors for applications	Jan 31, 2025

View more what's new in Glue

Data integration and management

Monitor & debug ETL jobs and track usage
Go to job run monitoring

Connect to your data stores
Go to connections

Orchestrate jobs to build data pipelines
Go to workflows

Manage and protect data
Create a job to evaluate data quality | Create a job to detect sensitive data

Visually clean and prepare a dataset for analysis
Go to AWS Glue DataBrew

Administration
Go to data catalog settings | Go to security configurations

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iTunes | AWS Glue | eu-west... | OBS 31.0.2 - Profile:...

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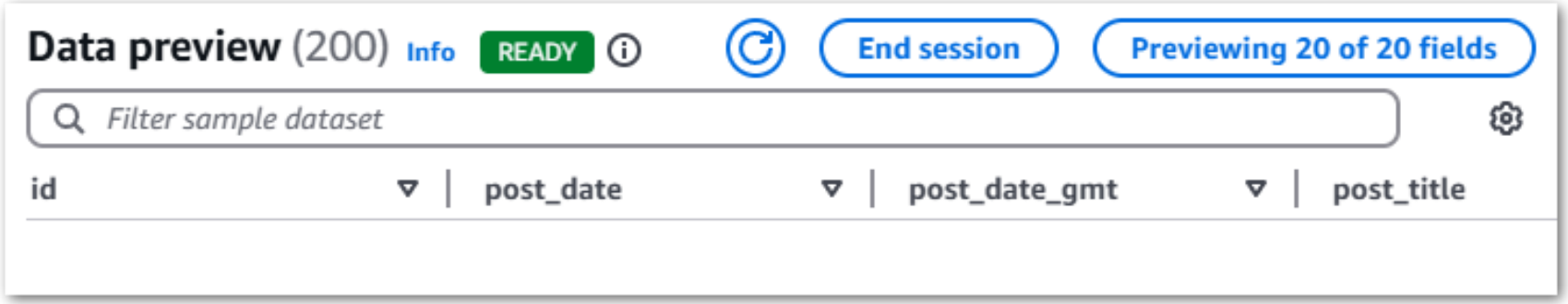
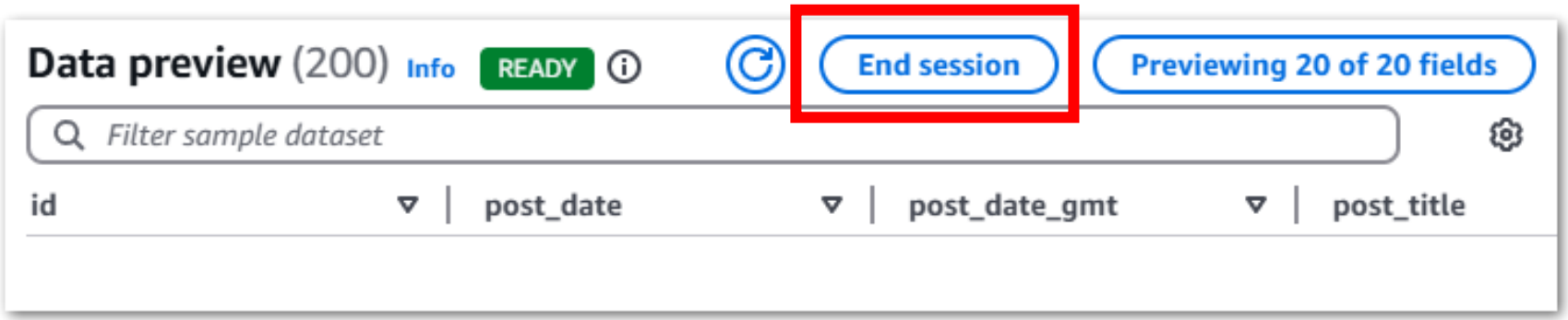
23/03/2025

COST DRIVER #1: OPEN SESSIONS

COST DRIVER: ACTIVE SESSION



COST DRIVER: ACTIVE SESSION



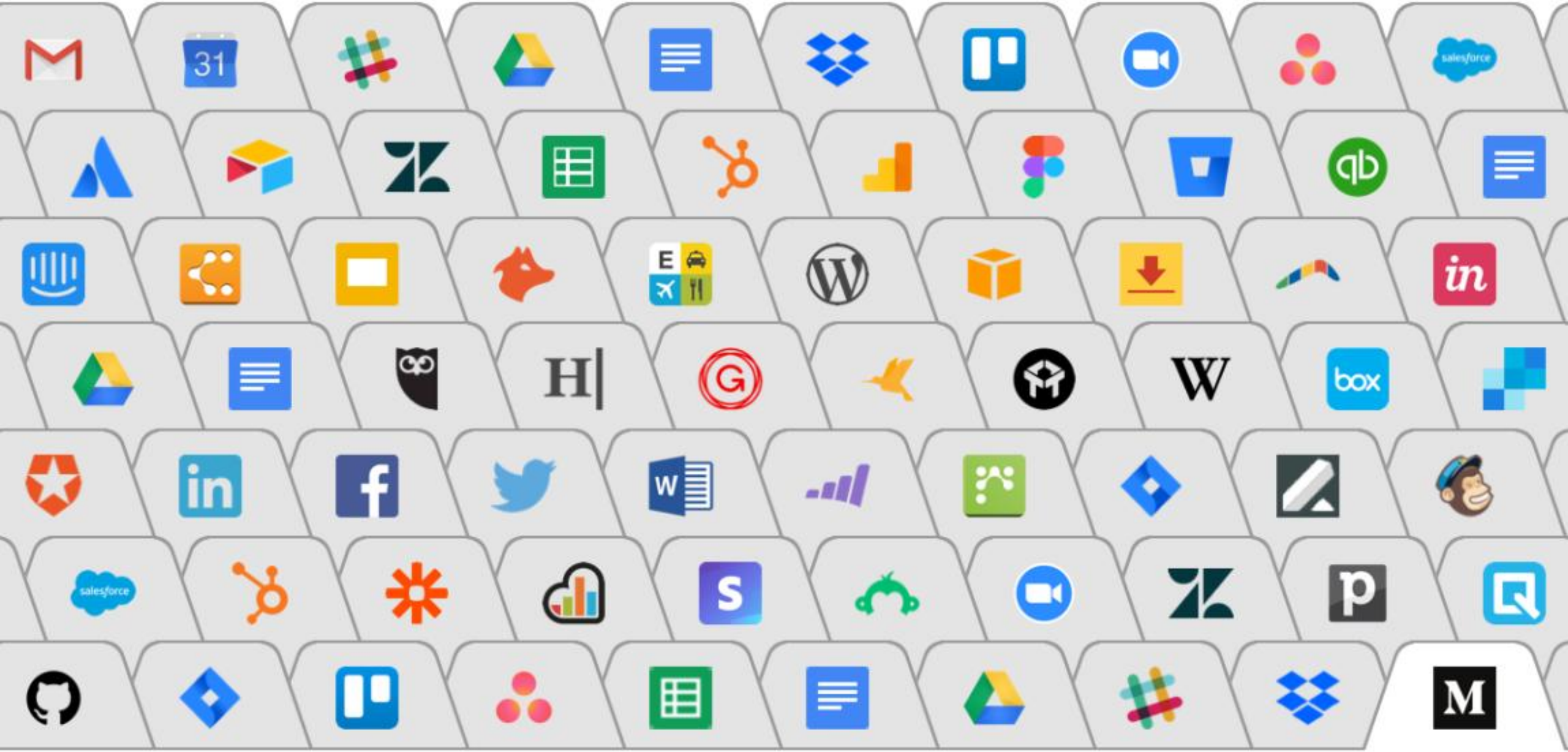
COST DRIVER #2: MULTIPLE SESSIONS

COST DRIVER: MULTIPLE SESSIONS

ONE TAB

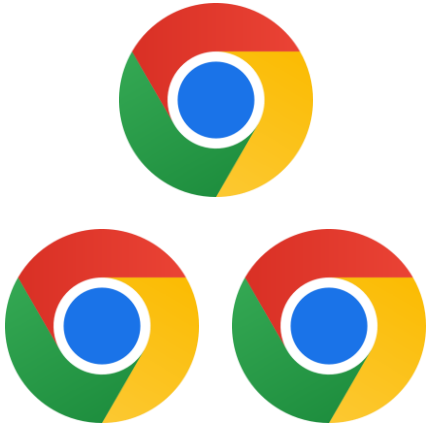
ONE SESSION

ONE BILLABLE RESOURCE

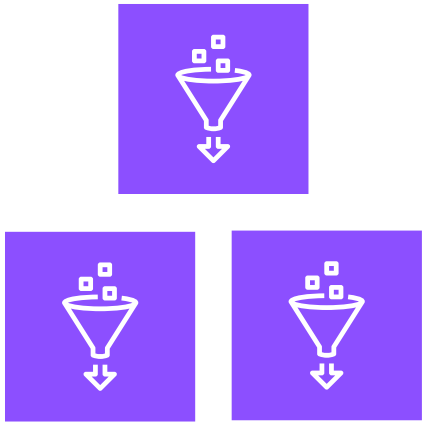

31
salesforce
in
box
salesforce

COST DRIVER: MULTIPLE SESSIONS

MANY TABS



MANY SESSIONS



MANY BILLABLE RESOURCES!

THE CAUSE

WHAT DID I DO?

OPTION ONE:

PARAMETER ADJUSTMENT

Change the timeout value manually.

CreateSession

PDF

Creates a new session.

Request Syntax

```
{
   "Command": {
      "Name": "string",
      "PythonVersion": "string"
   },
   "Connections": {
      "Connections": [ "string" ]
   },
   "DefaultArguments": {
      "string" : "string"
   },
   "Description": "string",
   "GlueVersion": "string",
   "Id": "string",
   "IdleTimeout": number,
   "MaxCapacity": number,
```

IdleTimeout

The number of minutes when idle before session times out. Default for Spark ETL jobs is value of Timeout. Consult the documentation for other job types.

Type: Integer

Valid Range: Minimum value of 1.

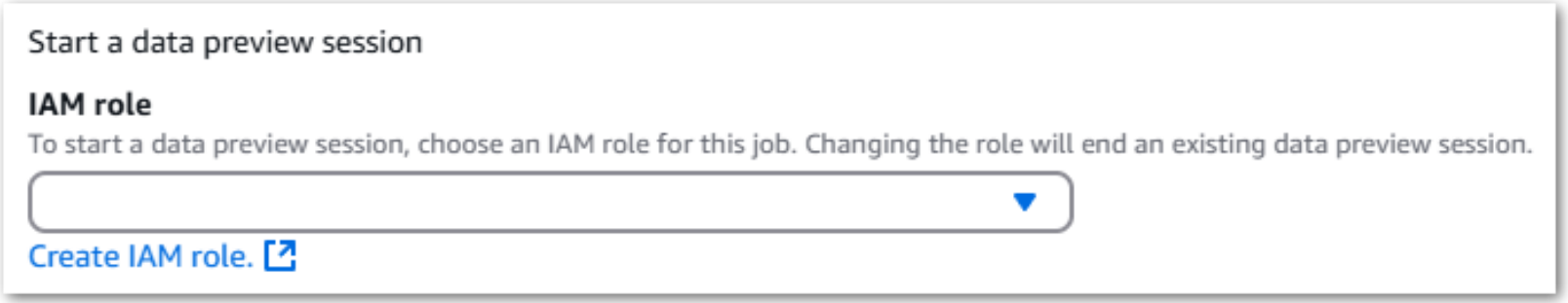
Required: No

OPTION TWO:

DENY PERMISSIONS

Stop anyone from starting a session.

PERMISSION BLOCKING



Developing and testing AWS Glue job scripts locally

PDF RSS Focus mode

▶ On this page

When you develop and test your AWS Glue for Spark job scripts, there are multiple available options:

- AWS Glue Studio console
  - Visual editor
  - Script editor
  - AWS Glue Studio notebook
- Interactive sessions
  - Jupyter notebook
- Docker image
  - Local development
  - Remote development
- AWS Glue Studio ETL library
  - Local development

Documentation > AWS Glue > User Guide

Developing and testing AWS Glue job scripts locally

PDF RSS Focus mode

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  - Local development

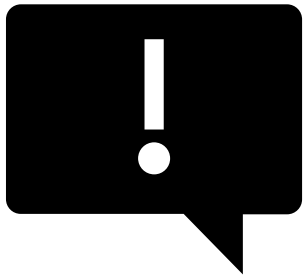
OPTION THREE:

EVENT-BASED AUTOMATION

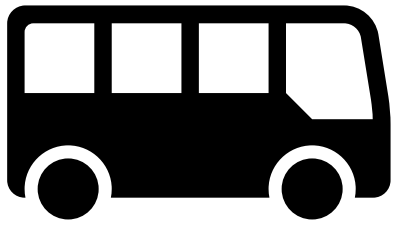
Automate all the things.

EVENT-BASED AUTOMATION

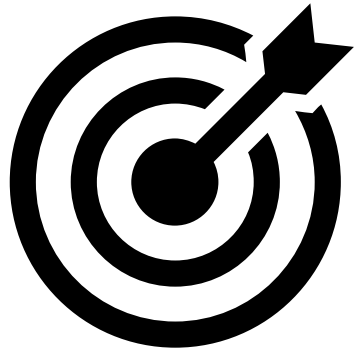
SOURCE



BUS



TARGET

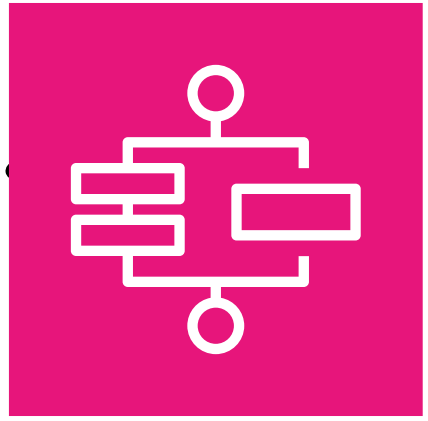


EVENT-BASED AUTOMATION

AWS GLUE

AMAZON EVENTBRIDGE

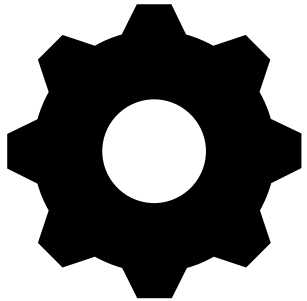
AWS STEP FUNCTIONS



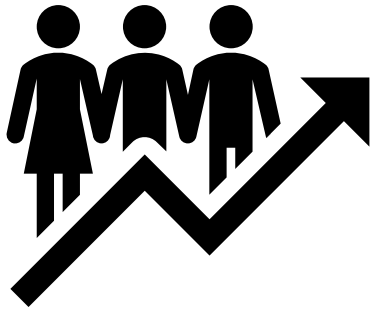
EVENT-BASED AUTOMATION

FAST

RESILIENT



SCALABILITY



EVENT-BASED & EVENT-DRIVEN

JAMES EASTHAM

@SERVERLESSJAMES

Developer Advocate @ Datadog

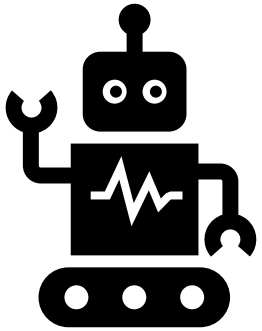
Ex AWS

EVENT-DRIVEN SYSTEM

BUSINESS FOCUSED

EVENT-BASED SYSTEM

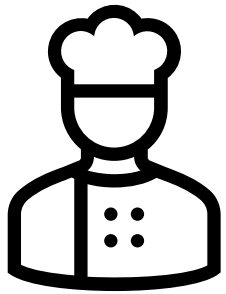
TECHNICAL FOCUSED



EVENT-DRIVEN SYSTEMS

BUSINESS EVENTS

PIZZA COOKED

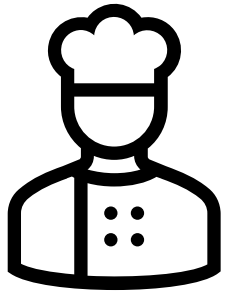


REVIEW LEFT

EVENT-DRIVEN SYSTEMS

BUSINESS EVENTS

PIZZA COOKED



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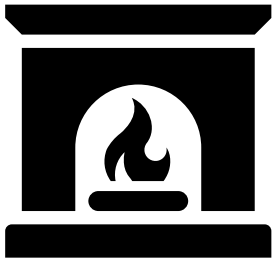
BIGGER OVEN



=

MORE PIZZAS

EVENT-DRIVEN SYSTEMS

BUSINESS EVENTS

REVIEW LEFT

CHEAPER REVIEW PLATFORM

FEEDBACK COSTS REDUCED

EVENT-BASED SYSTEMS

TECHNICAL EVENTS

SUCCESSFUL LOGIN

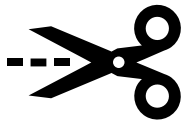
RELATIONAL
DATABASE WRITE

EVENT-BASED SYSTEMS

TECHNICAL EVENTS

LOGIN SUCCESSFUL

REMOVE LOGIN REQUIREMENT



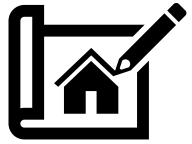
EASIER TO REVIEW

EVENT-BASED SYSTEMS

TECHNICAL EVENTS

RELATIONAL
DATABASE WRITE

REARCHITECT
DATABASE



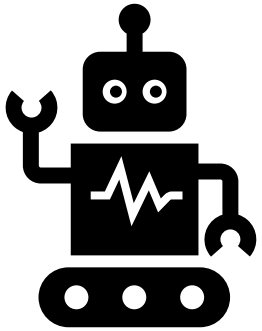
LESS DEVELOPER
OVERHEAD

EVENT-DRIVEN SYSTEM

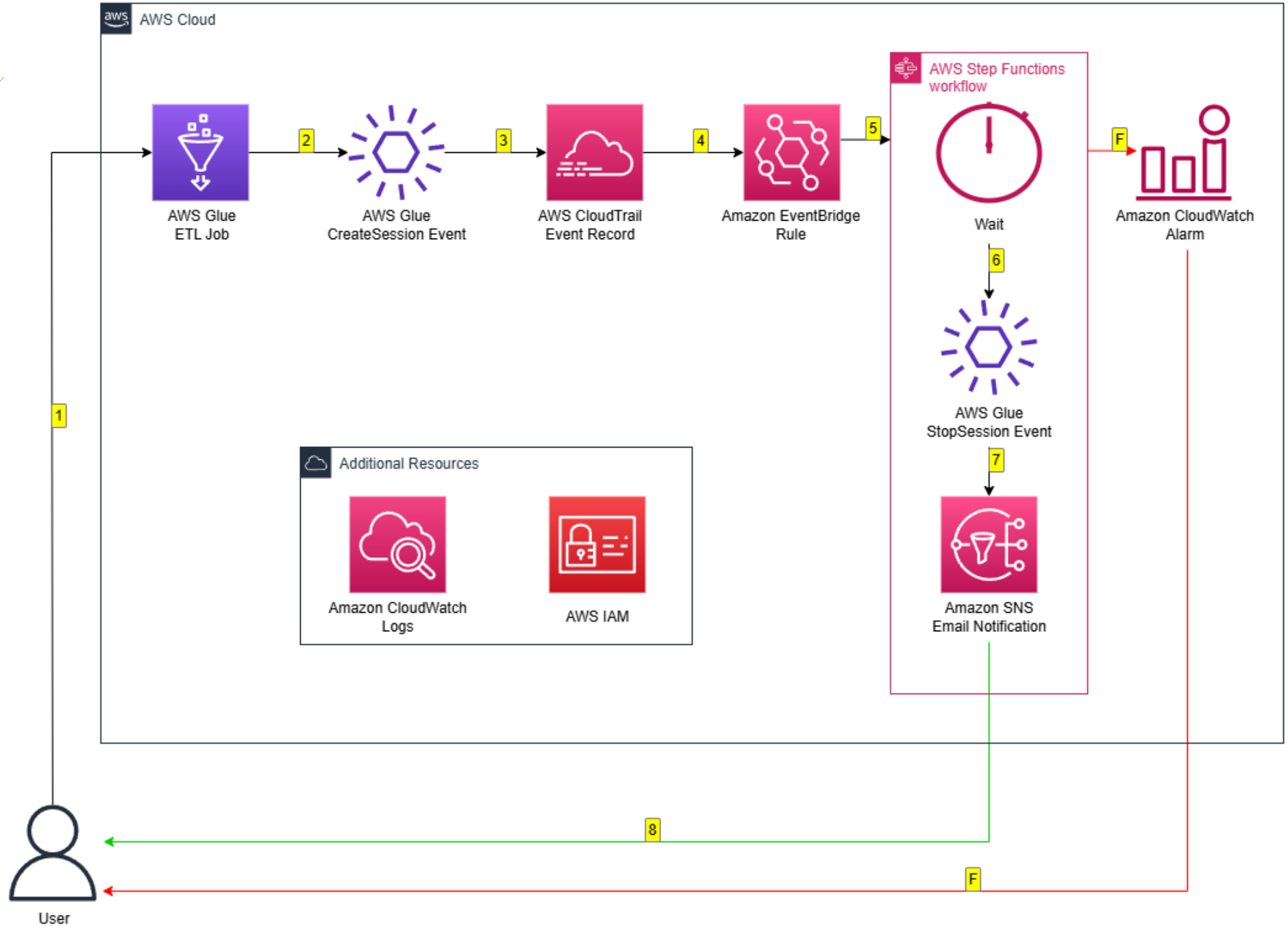
LANGUAGE OF BUSINESS

EVENT-BASED SYSTEM

LANGUAGE OF TECHNOLOGY



HOW DID I CREATE IT?


AWS Cloud
AWS Step Functions workflow
AWS Glue ETL Job
AWS Glue CreateSession Event
AWS CloudTrail Event Record
Amazon EventBridge Rule
Wait
Amazon CloudWatch Alarm
AWS Glue StopSession Event
Amazon SNS Email Notification
Additional Resources
Amazon CloudWatch Logs
AWS IAM
User
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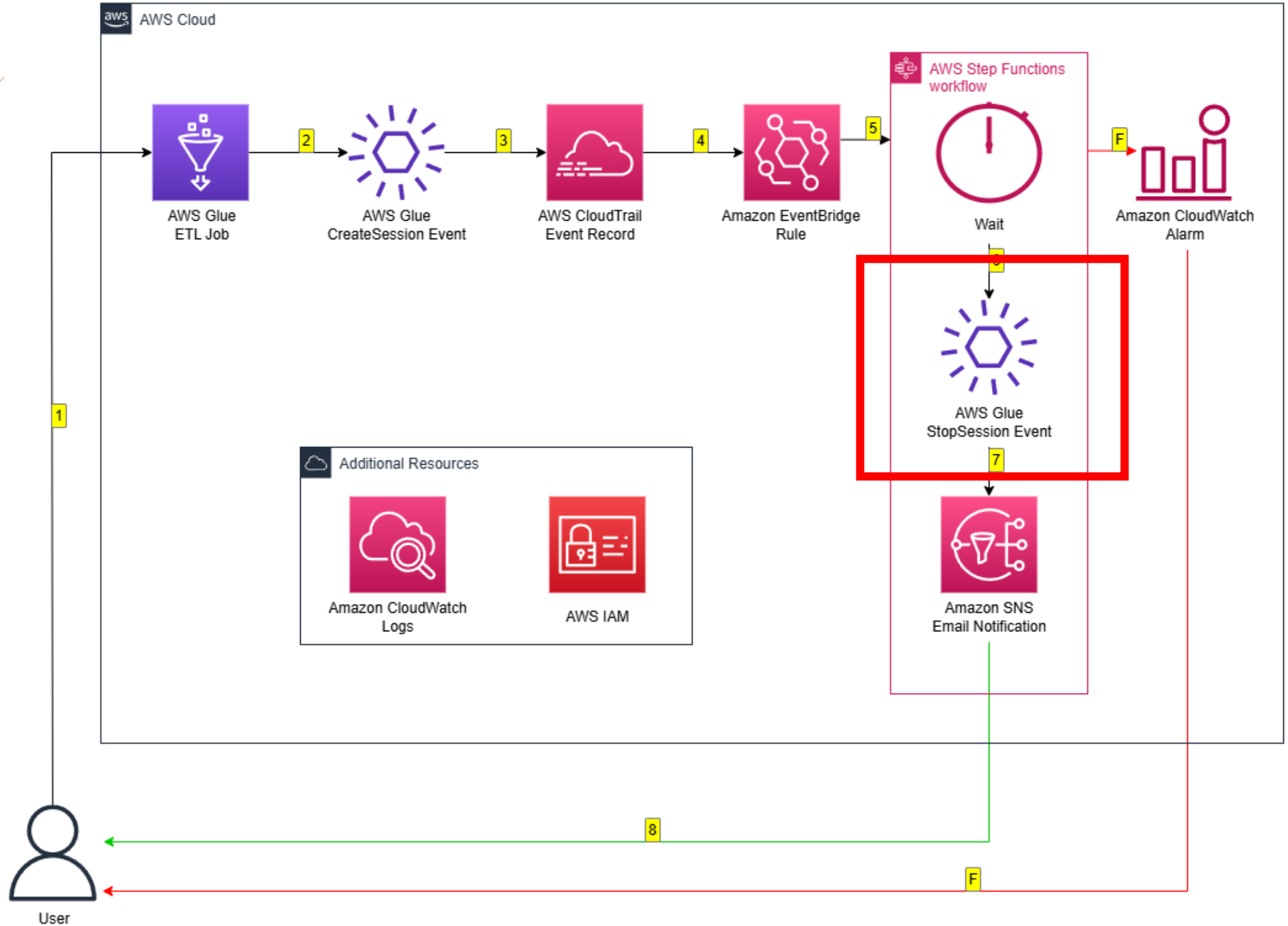
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Additional Resources
Amazon CloudWatch Logs
AWS IAM
Amazon SNS Email Notification
User
1
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3
4
5
6
7
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F

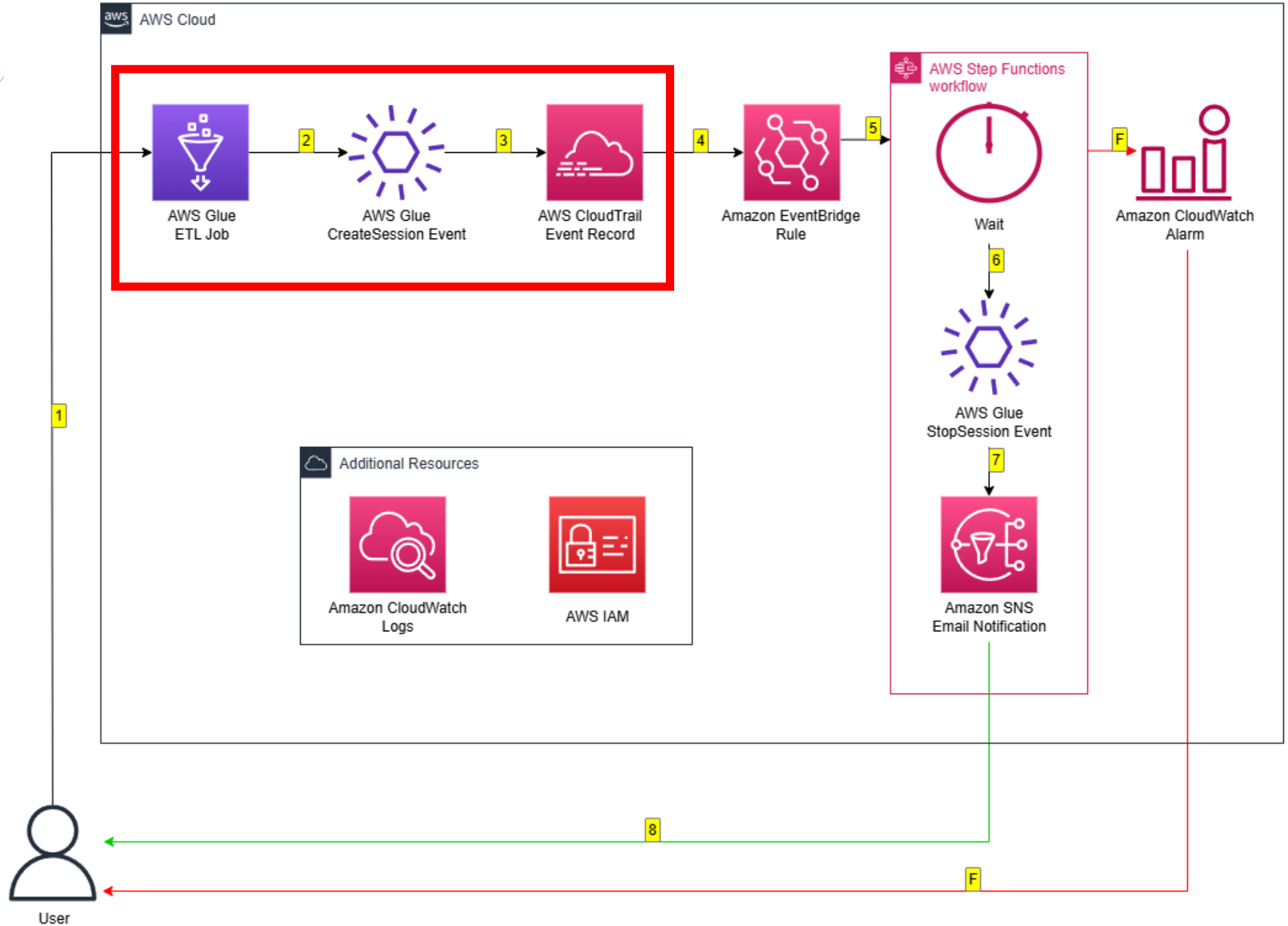
StopSession

PDF

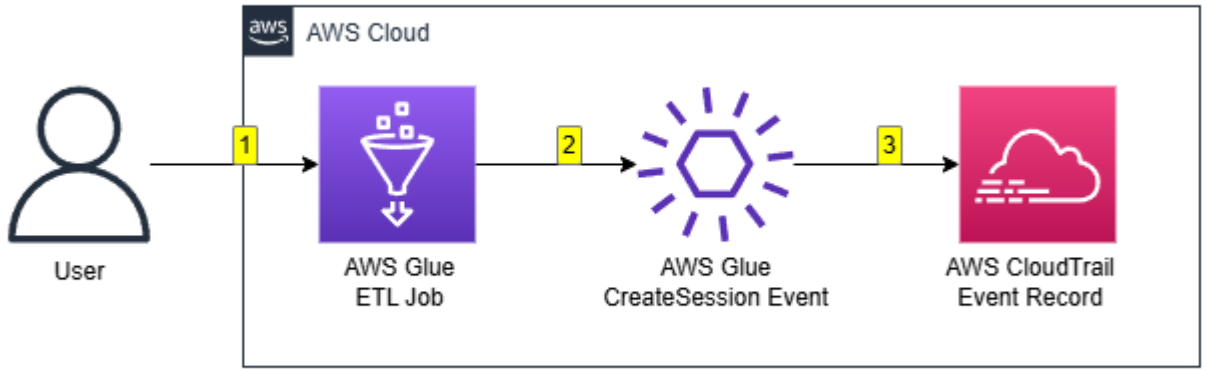
Stops the session.

Request Syntax

```
{
   "Id": "string",
   "RequestOrigin": "string"
}
```


AWS Cloud
AWS Glue
ETL Job
2
AWS Glue
CreateSession Event
3
AWS CloudTrail
Event Record
4
Amazon EventBridge
Rule
5
AWS Step Functions
workflow
Wait
6
AWS Glue
StopSession Event
7
Amazon SNS
Email Notification
F
Amazon CloudWatch
Alarm
1
Additional Resources
Amazon CloudWatch
Logs
AWS IAM
8
F
User

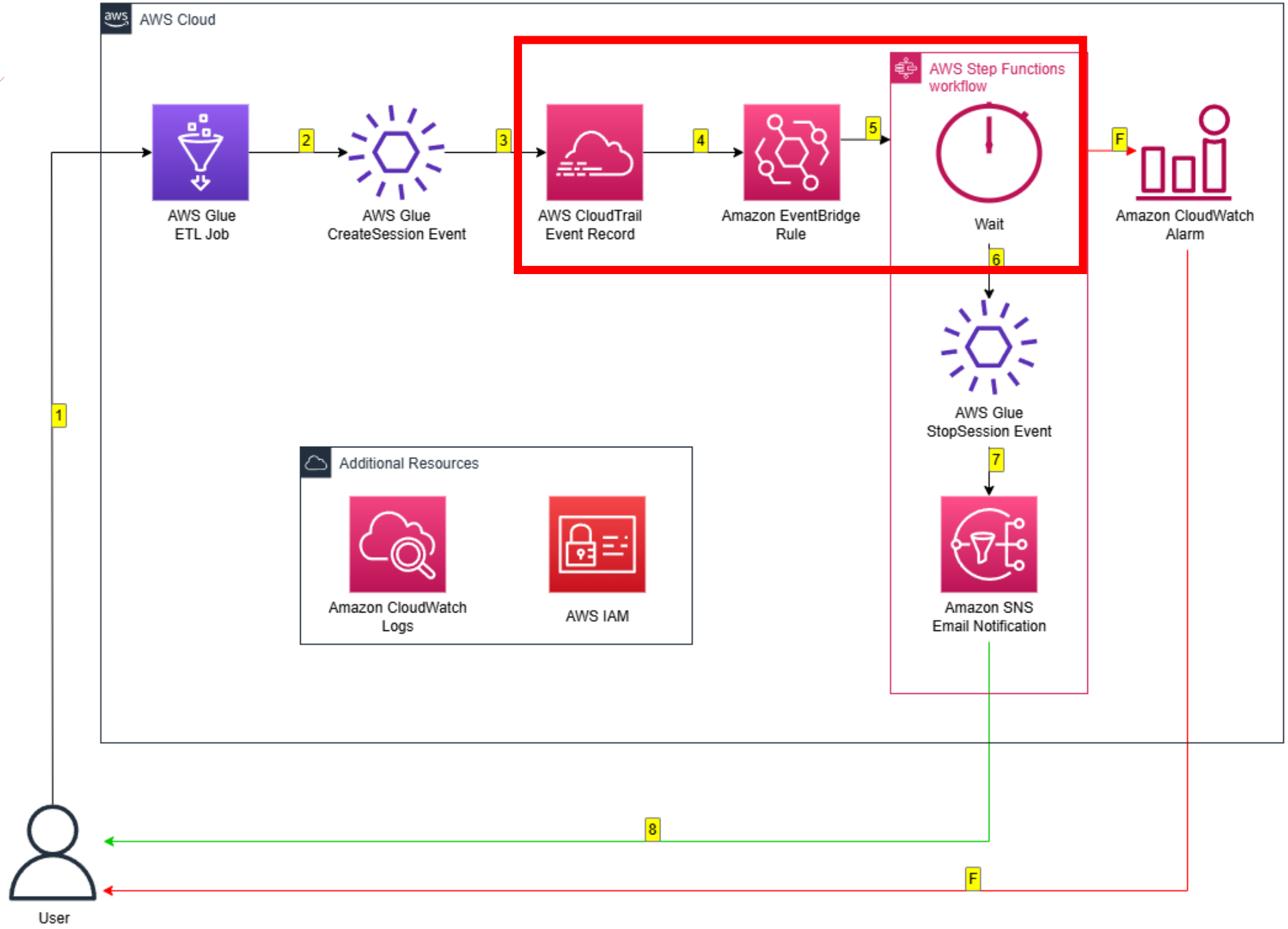
ARCHITECTURE DIAGRAM 1-3



GLUE CREATESESSION EVENT


```
{
    "eventSource": "glue.amazonaws.com",
    "eventName": "CreateSession",
    "requestParameters": {
        "id": "glue-studio-datapreview-e09f88a9-4d7f-4e64-95f2-e435fbd1963a",
        "command": {
            "name": "glueetl",
            "pythonVersion": "3"
        },
        "idleTimeout": 30,
        "maxCapacity": 2,
        "glueVersion": "4.0",
        "requestOrigin": "GlueStudioDataPreview"
    },
}
```

GLUE CREATESESSION EVENT


AWS Cloud
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AWS Glue StopSession Event
Amazon SNS Email Notification
Additional Resources
Amazon CloudWatch Logs
AWS IAM
User
1
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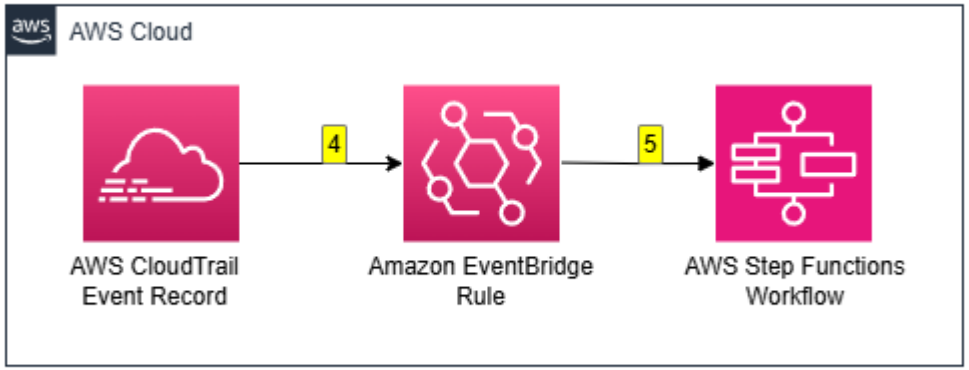
ARCHITECTURE DIAGRAM 3-5

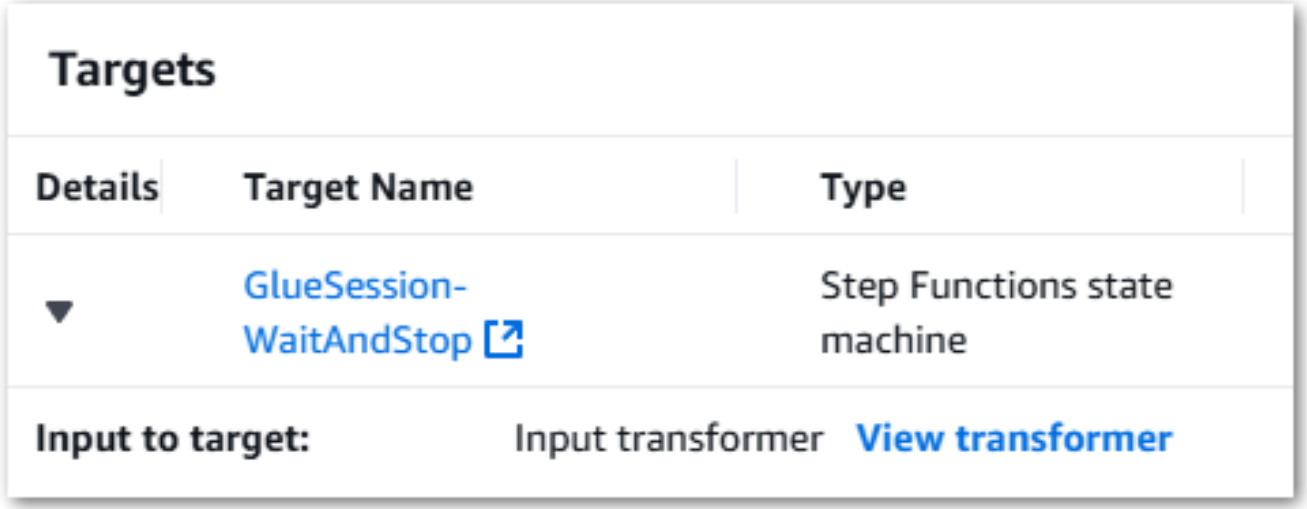


EVENTBRIDGE RULE – EVENT PATTERN

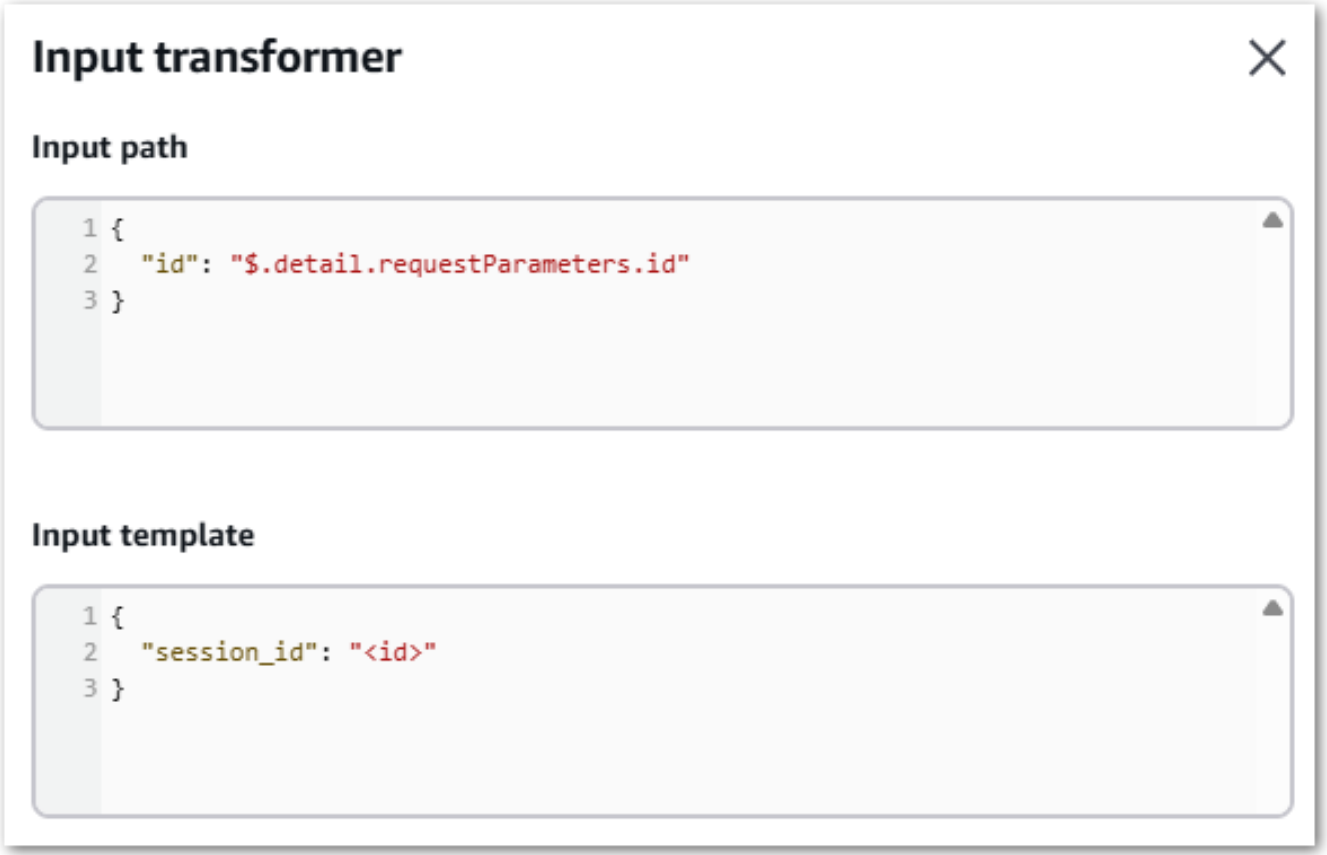
Event pattern Info

```
{
  "source": ["aws.glue"],
  "detail-type": ["AWS API Call via CloudTrail"],
  "detail": {
    "eventSource": ["glue.amazonaws.com"],
    "eventName": ["CreateSession"]
  }
}
```

EVENTBRIDGE RULE – EVENT PATTERN



EVENTBRIDGE RULE – INPUT TRANSFORMER

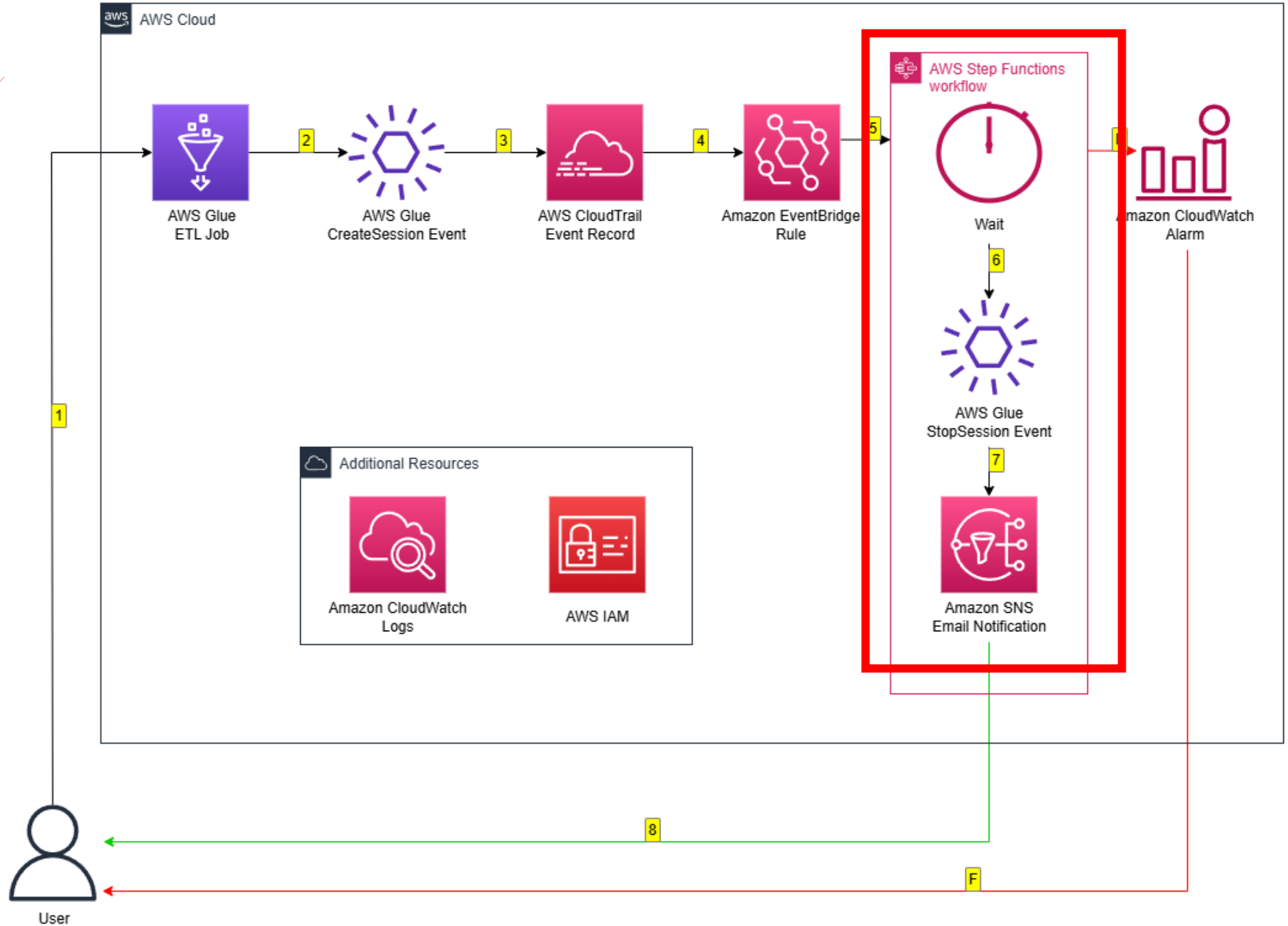


Input transformer

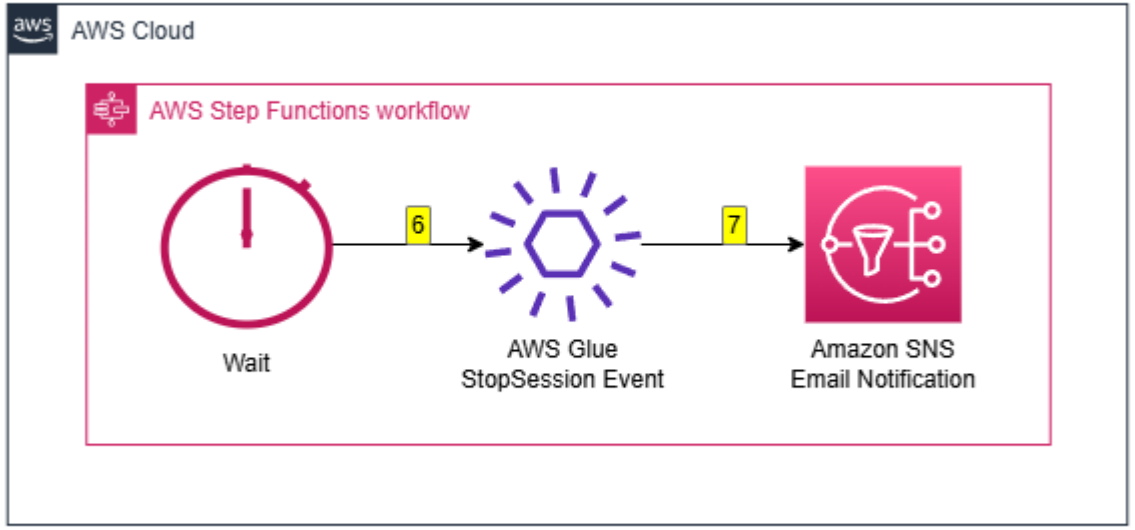
Input path

```
{
  "id": "$.detail.requestParameters.id"
}
```

EVENTBRIDGE RULE – INPUT TRANSFORMER


AWS Cloud
AWS Step Functions workflow
AWS Glue ETL Job
AWS Glue CreateSession Event
AWS CloudTrail Event Record
Amazon EventBridge Rule
Wait
Amazon CloudWatch Alarm
AWS Glue StopSession Event
Amazon SNS Email Notification
Additional Resources
Amazon CloudWatch Logs
AWS IAM
User
1
2
3
4
5
6
7
8
F

ARCHITECTURE DIAGRAM STEP F



WAIT

```
"StopGlueSession": {
      "Type": "Task",
      "Resource": "arn:aws:states:::aws-sdk:glue:stopSession",
      "Parameters": {
        "Id.$": "$.session_id"
      },
      "Next": "SNS Publish",
      "Retry": [
        {
          "ErrorEquals": [
            "States.ALL"
          ],
          "IntervalSeconds": 10,
          "MaxAttempts": 3
        }
      ]
    }
```

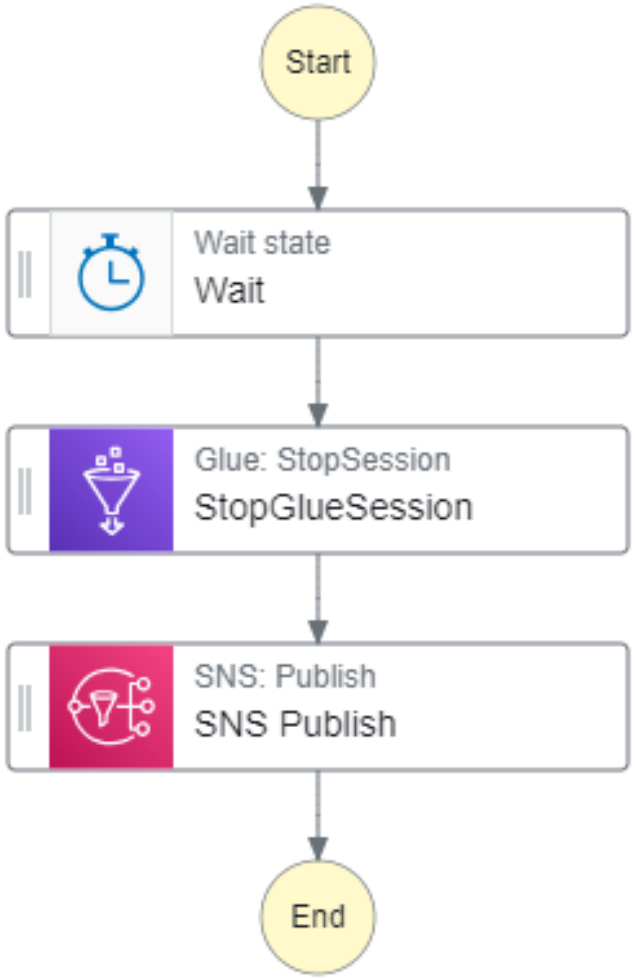
```
"StopGlueSession": {
      "Type": "Task",
      "Resource": "arn:aws:states:::aws-sdk:glue:stopSession",
      "Parameters": {
        "Id.$": "$.session_id"
      },
      "Next": "SNS Publish",
      "Retry": [
        {
          "ErrorEquals": [
            "States.ALL"
          ],
          "IntervalSeconds": 10,
          "MaxAttempts": 3
        }
      ]
    }
```

```
"StopGlueSession": {
      "Type": "Task",
      "Resource": "arn:aws:states:::aws-sdk:glue:stopSession",
      "Parameters": {
        "Id.$": "$.session_id"
      },
      "Next": "SNS Publish",
      "Retry": [
        {
          "ErrorEquals": [
            "States.ALL"
          ],
          "IntervalSeconds": 10,
          "MaxAttempts": 3
        }
      ]
    }
```

SNS

```
"SNS Publish": {
      "Type": "Task",
      "Resource": "arn:aws:states:::sns:publish",
      "Parameters": {
        "TopicArn": "arn:aws:sns:REDACTED:REDACTED:success-stepfunction",
        "Message.$": "States.Format('Hi! AWS Step Functions has stopped this Glue session for you: {}', $)"
      },
      "End": true
    }
```

STEP FUNCTIONS STUDIO



DEMO: GLUE

AWS Glue
Getting started
ETL jobs
Visual ETL
Notebooks
Job run monitoring
Data Catalog tables
Data connections
Workflows (orchestration)
Zero-ETL integrations New
Data Catalog
Databases
Tables
Stream schema registries
Schemas
Connections
Crawlers
Classifiers
Catalog settings
Data Integration and ETL
Zero-ETL integrations New
ETL jobs
Visual ETL
Notebooks
Job run monitoring
Interactive Sessions
Data classification tools
Sensitive data detection
Record Matching
Triggers
Workflows (orchestration)
Blueprints
Security configurations
Cost management New
Legacy pages
Connections (legacy)
Jobs (legacy)

AWS Glue Studio Info

Create job Info

Author in a visual interface focused on data flow.
Visual ETL

Author using an interactive code notebook.
Notebook

Author code with a script editor.
Script editor

Example jobs Info

Create example job

Your jobs (6) Info

Actions | Run job

Filter jobs by property

1

Job name	Type	Created by	Last modified	AWS Glue version
WordPress_Gold_statisticspagespostsjoin_botodelete	Glue ETL	Script	28/10/2024, 22:29:26	4.0
WordPress_Gold_statisticspagespostsjoin_mod	Glue ETL	Script	28/10/2024, 17:51:15	4.0
WordPress_Gold_statisticspagespostsjoin	Glue ETL	Visual	23/08/2024, 11:04:05	4.0
wordpressapi_silver	Python shell	Script	09/08/2024, 13:30:58	
bronze-statistics_pages_crawler	Glue ETL	Visual	12/03/2024, 15:30:57	4.0
bronze-statistics_pages	Glue ETL	Visual	12/03/2024, 13:09:19	4.0

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DEMO: STEP FUNCTION

Step Functions
State machines
Activities
Developer resources
Online learning workshop
Local Development
Data flow simulator
Feature spotlight
Documentation
Join our feedback panel

GlueSession-WaitAndStop

Edit | Actions | Start execution

Details

Arn
arn:aws:states:eu-west-1:973122011240:stateMachine:GlueSession-WaitAndStop

IAM role ARN
arn:aws:iam::973122011240:role/service-role/StepFunctions-GlueSession-WaitAndStop-role-b8l7sy5xc

Type
Standard

Status
Active

Creation date
Jun 5, 2024, 19:31:49 (UTC+01:00)

X-Ray tracing
Disabled

Executions | Monitoring | Logging | Definition | Aliases | Versions | Tags

Executions (0/0)

View details | Stop execution | Redrive | Start execution

Filter executions by property or value | All | Last 15 months | Local timezone | 0 matches | 1

Name	Status	Start Time (local)	End Time (local)	Duration Info	Version	Alias

No executions
Start execution

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OUTCOMES

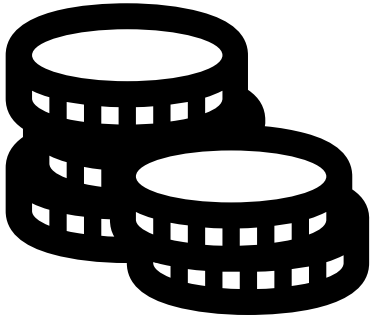
GLUE INTERACTIVE SESSIONS 2024 H2

ARCHITECTURE COSTS 2024 H2

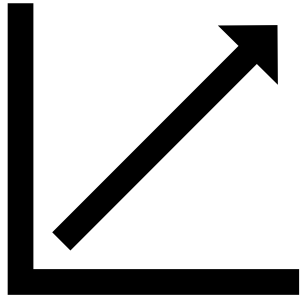
LIMITATIONS

REACTIVE SOLUTION

STILL SOME GLUE COST

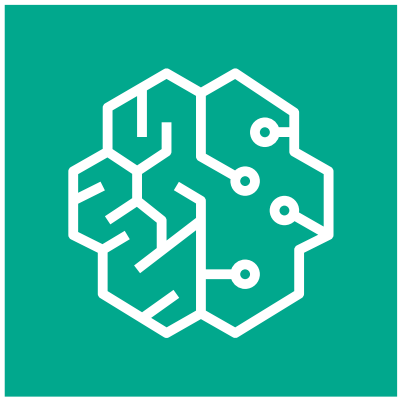


POTENTIAL WORKFLOW COST

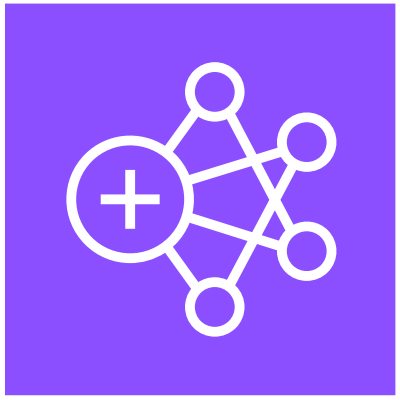


OTHER APPLICATIONS: STOP OTHER SERVICES

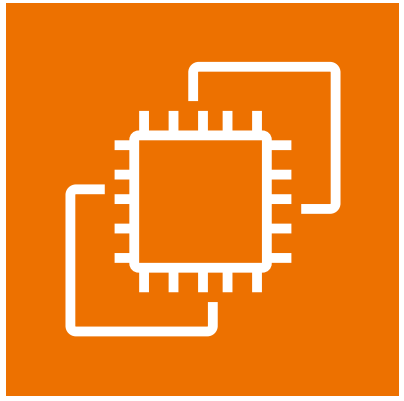
AMAZON SAGEMAKER



AMAZON EMR

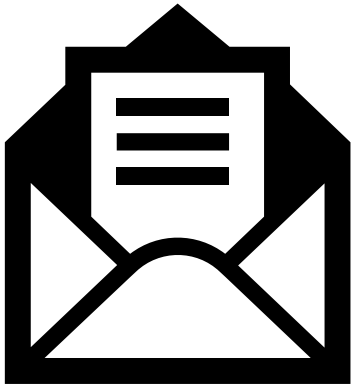


AMAZON EC2

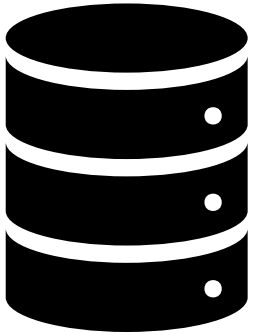


OTHER APPLICATIONS: PERFORM OTHER ACTIONS

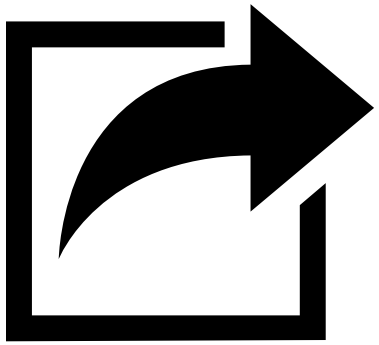
EMAIL & SLACK NOTIFICATIONS



BESPOKE LOGGING



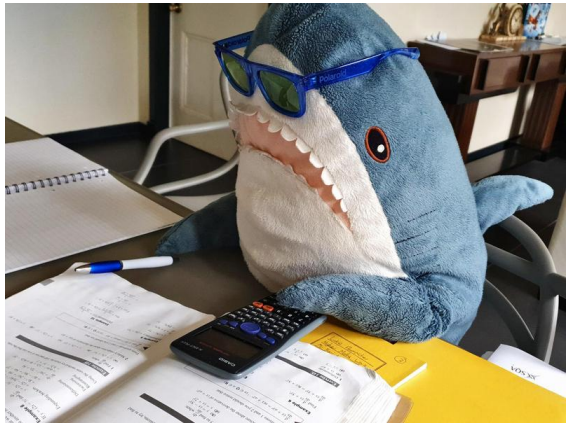
TRIGGER SEPARATE WORKFLOW



SUMMARY

AGENDA

FIND THE CAUSE



CONSIDER YOUR OPTIONS

BUILD A SOLUTION

THANK YOU

Me & Session Resources

AWS User Group Lancashire