

The background features a vibrant, multi-colored gradient. It starts with a dark blue on the left, transitions through purple and magenta, and then into bright orange and yellow towards the right. A diagonal line separates the darker blue/purple area from the lighter orange/yellow area.

AWS
re:Invent

A R C 3 1 6

Deploy and monitor a serverless application

Jon Handler

Principal Search Services SA
AWS

Safeer Mohiuddin

Software Development Engineer
AWS

AWS Event Engine

<https://dashboard.eventengine.run>



Created to help AWS field teams run:

- Workshops
- GameDays
- Bootcamps
- Immersion Days
- And other events that require hands-on access to AWS accounts

Event Engine Login

ARC101-R2 Introduction to AWS

Team Hash: a1b2c3d4e5f6


Go to: <https://dashboard.eventengine.run>

Please contact your event operator if you have any questions!

AWS
re:Invent

<https://dashboard.eventengine.run>

← → ↻ 🏠 🔒 https://dashboard.eventengine.run/login



Who are you?

Terms & Conditions:

1. By using the Event Engine for the relevant event, you agree to the Event Terms and Conditions and the AWS Acceptable Use Policy. You acknowledge and agree that are using an AWS-owned account that you can only access for the duration of the relevant event. If you find residual resources or materials in the AWS-owned account, you will make us aware and cease use of the account. AWS reserves the right to terminate the account and delete the contents at any time.
2. You will not: (a) process or run any operation on any data other than test data sets or lab-approved materials by AWS, and (b) copy, import, export or otherwise create derivate works of materials provided by AWS, including but not limited to, data sets.
3. AWS is under no obligation to enable the transmission of your materials through Event Engine and may, in its discretion, edit, block, refuse to post, or remove your materials at any time.
4. Your use of the Event Engine will comply with these terms and all applicable laws, and your access to Event Engine will immediately and automatically terminate if you do not comply with any of these terms or conditions.

This is the 12 digit hash that was given to you or your team.

✓ Accept Terms & Login

<https://dashboard.eventengine.run/dashboard>

The screenshot shows a web browser window with the URL `https://dashboard.eventengine.run/dashboard`. The page has a header with "Dashboard" on the left and "Logout" on the right. The main content area is titled "Team Dashboard" and features a sub-section for "Event" with a cloud icon. Below this, there are two buttons: "AWS Console" (highlighted with a red box) and "SSH Key". The event details are as follows:

- Event: AWS Service Workshop**
- Team Name: Team-Workshop-One
- Event ID: [REDACTED]
- Team ID: [REDACTED]

Below the event details is a "Modules" section with a cube icon. It contains one module:

- AWS-ServiceWorkshop** with a "Readme" link.
- Outputs: No outputs defined

Continue from the lab guide

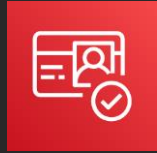
<https://reinvent.aesworkshops.com/arc316/>

... or if it's easier: <https://tinyurl.com/rvzb7z6>

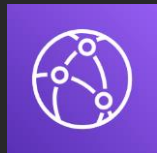
The AWS Bookstore demo

The screenshot displays the AWS Bookstore demo website. At the top left is the "BOOKSTORE" logo. On the top right, there are links for "Past orders", "Best sellers", and "Log out", along with a shopping cart icon. The main banner features a large image of a library interior with a curved staircase and bookshelves. Overlaid on the right side of the banner is the text "The more you read The more you know". Below the banner is a search bar with the placeholder text "Search" and a magnifying glass icon. To the right of the search bar is the text "Best deals of the day". A dark navigation bar contains the following categories: "Cookbooks", "Database", "Fairy Tales", "Science Fiction", "Home Improvement", "Cars", and "Woodwork". Below the navigation bar is a section titled "Bookstore Best Sellers" which displays six book covers: "101 Burgers", "SIMPLY ITALIAN", "noodles EVERY DAY", "The joys of Pancakes", "Spinach Pineapple Smoothie", and "Cherry Blossom". At the bottom of the page, there are three promotional tiles: "Your past orders" with a stack of books, "Your shopping cart" with a shopping cart icon on an orange background, and "Best Sellers" with a woman looking up at a bookshelf and five stars.

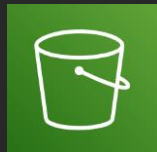
Application components



Amazon Cognito



Amazon CloudFront



Amazon Simple Storage Service (Amazon S3)

Front end

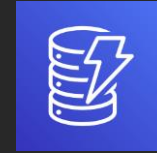


Amazon API Gateway

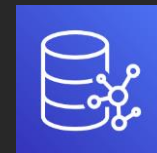


AWS Lambda

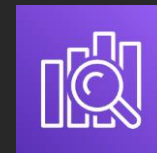
Serverless app



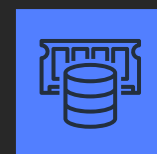
Amazon DynamoDB



Amazon Neptune

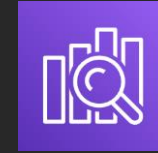


Amazon Elasticsearch Service

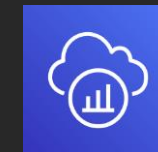


Amazon ElastiCache

Backend

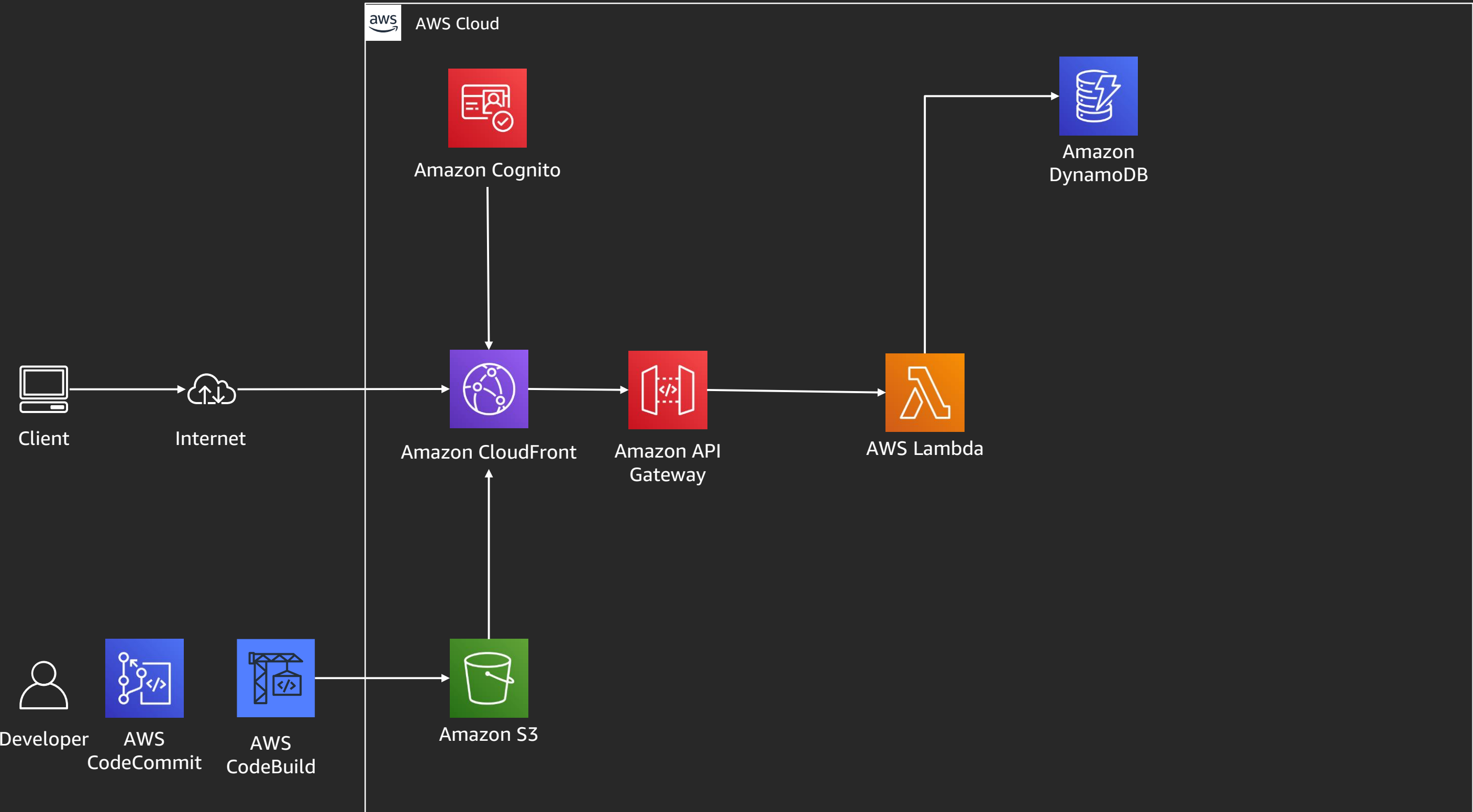


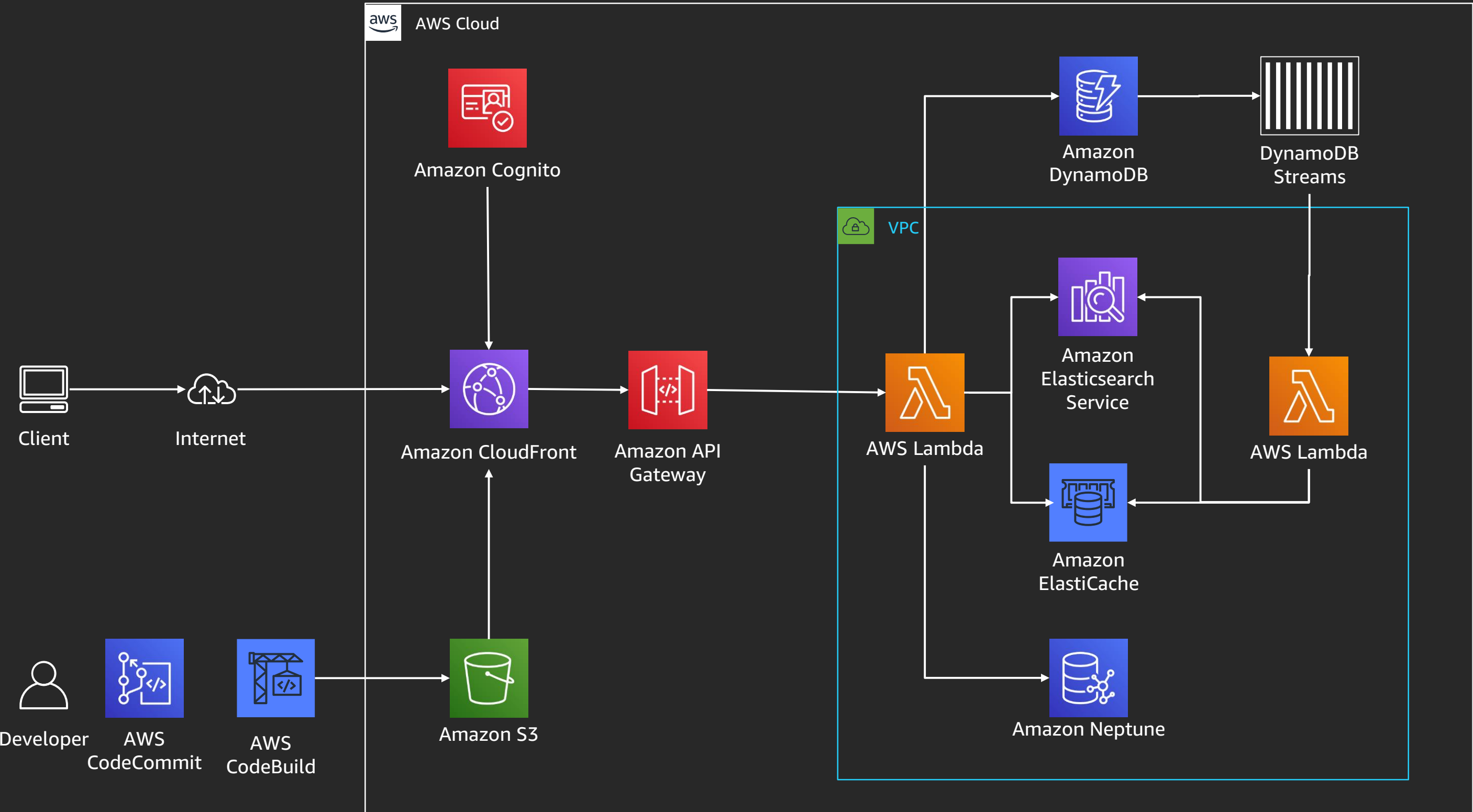
Amazon Elasticsearch Service

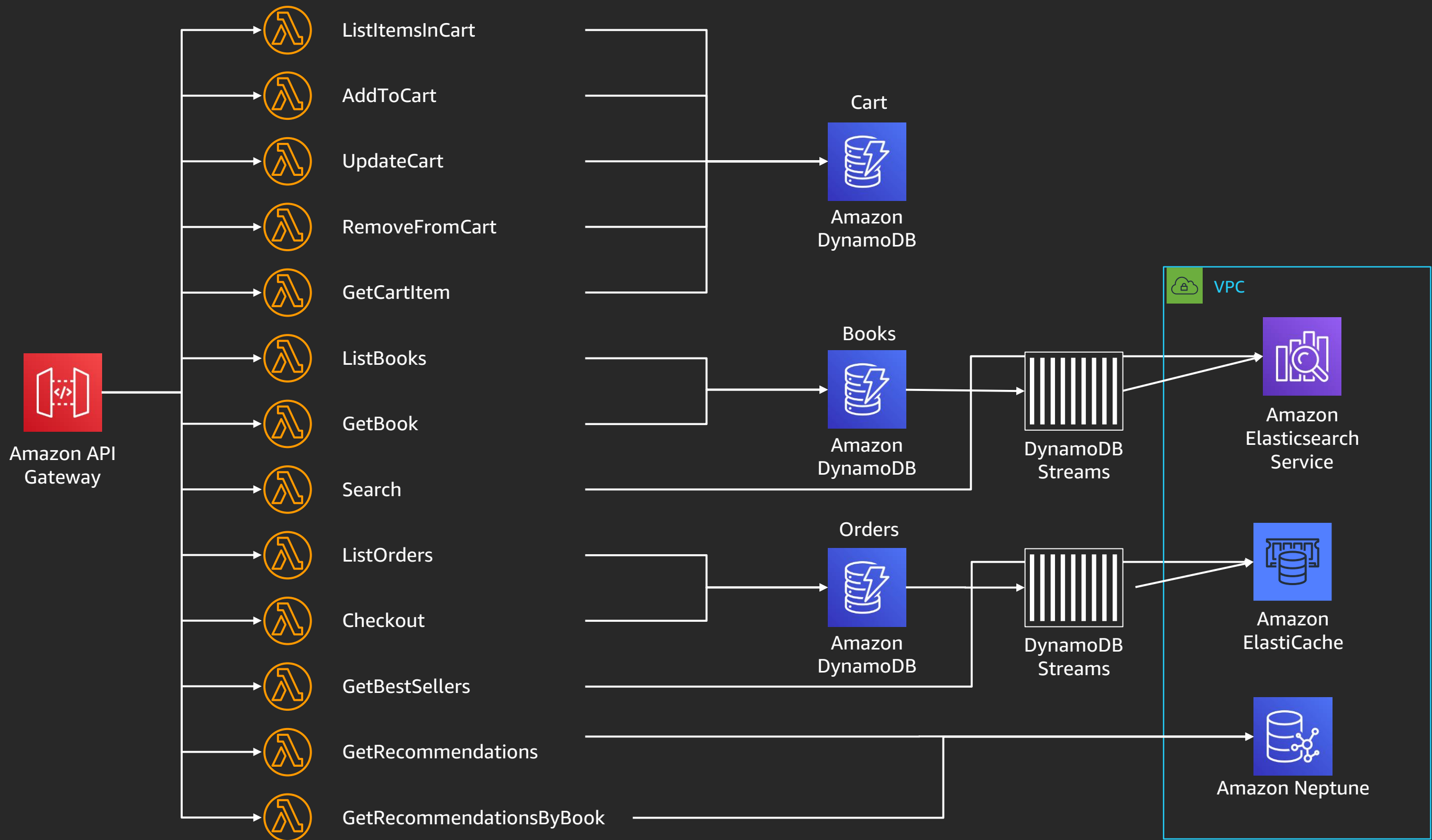


AWS X-Ray

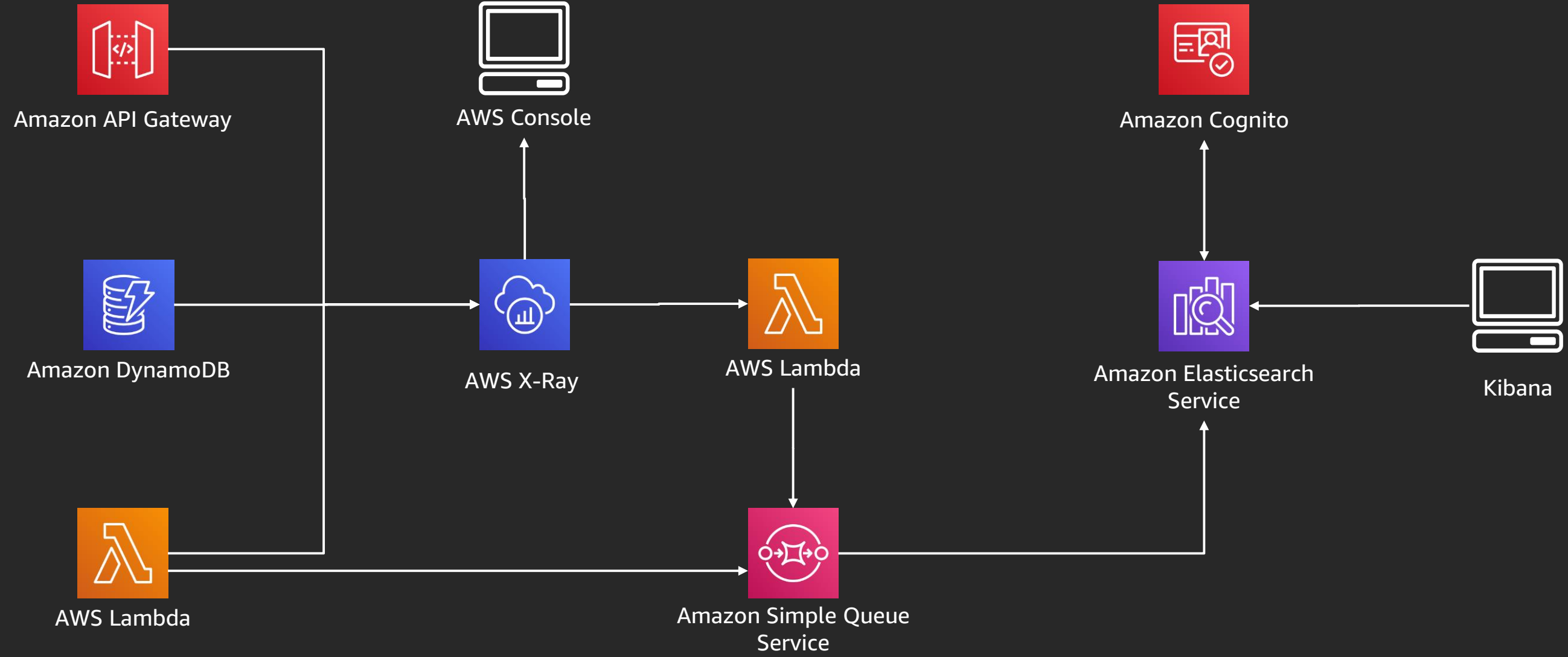
Monitoring







Monitoring

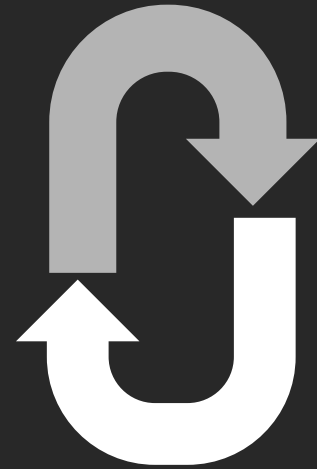


AWS X-Ray

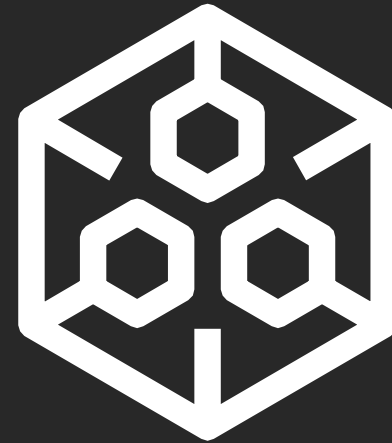
AWS X-Ray overview



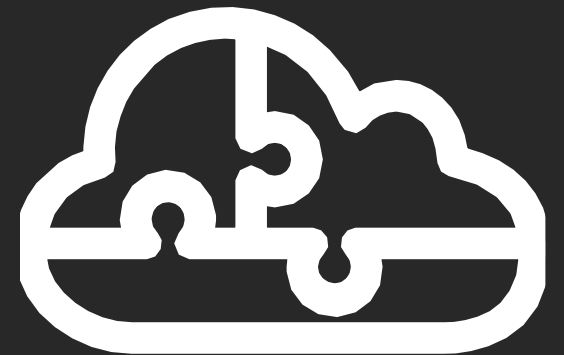
Analyze and debug
issues quickly



End-to-end view of
individual services



Identify customer
impact



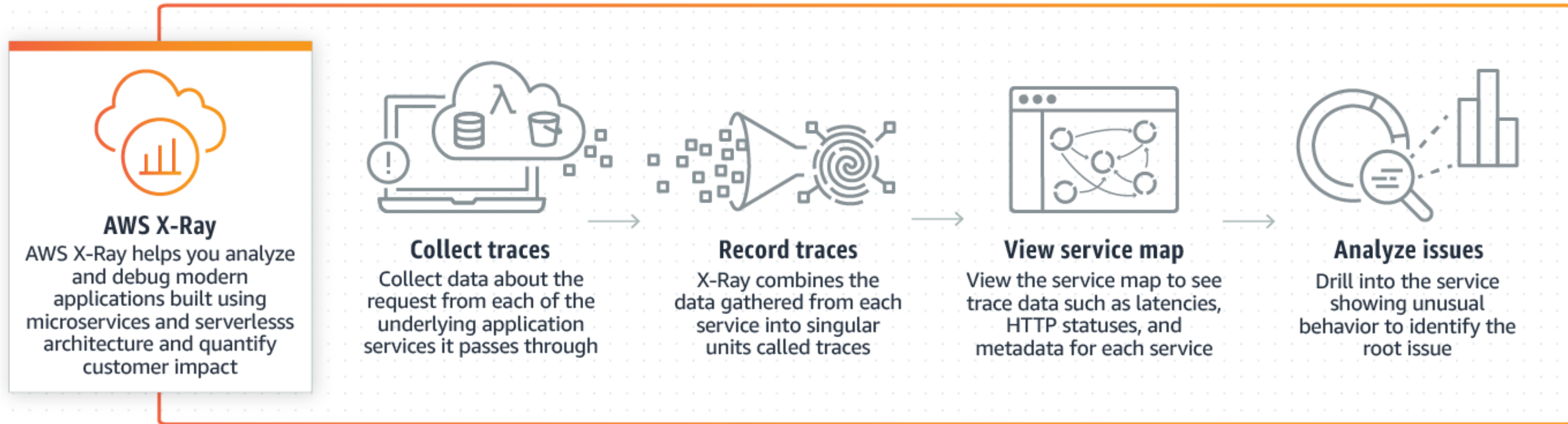
Cloud-agnostic

AWS X-Ray overview



AWS X-Ray helps developers
analyze and debug applications
that were built using **microservices** architecture
to identify the **root cause** and **end-user impact**.

How AWS X-Ray works



AWS X-Ray instrumentation



Strong open
source community



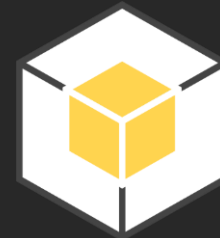
.NET
(with .NET Core 2.0)



Go (beta)



Java



Python

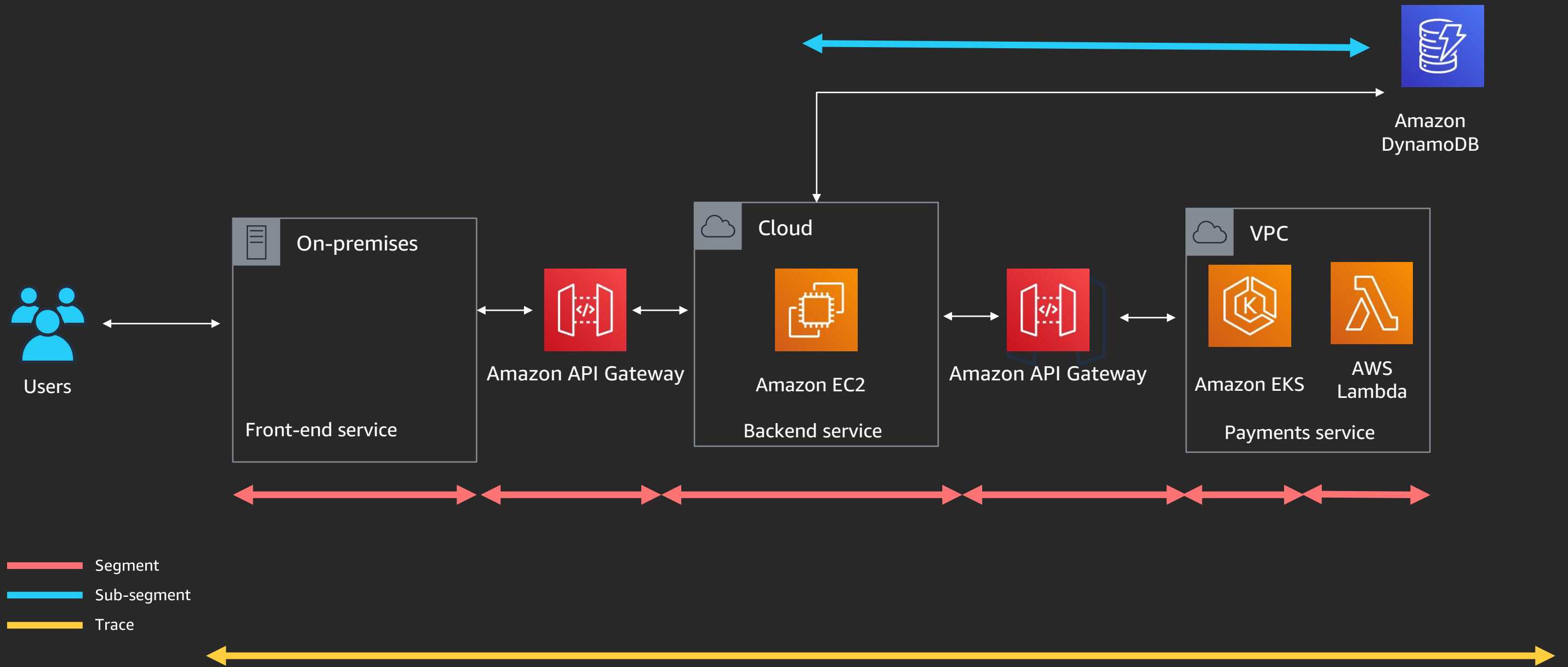


Ruby (beta)



Node.js

AWS X-Ray for your modern applications



Application instrumentation Node.js

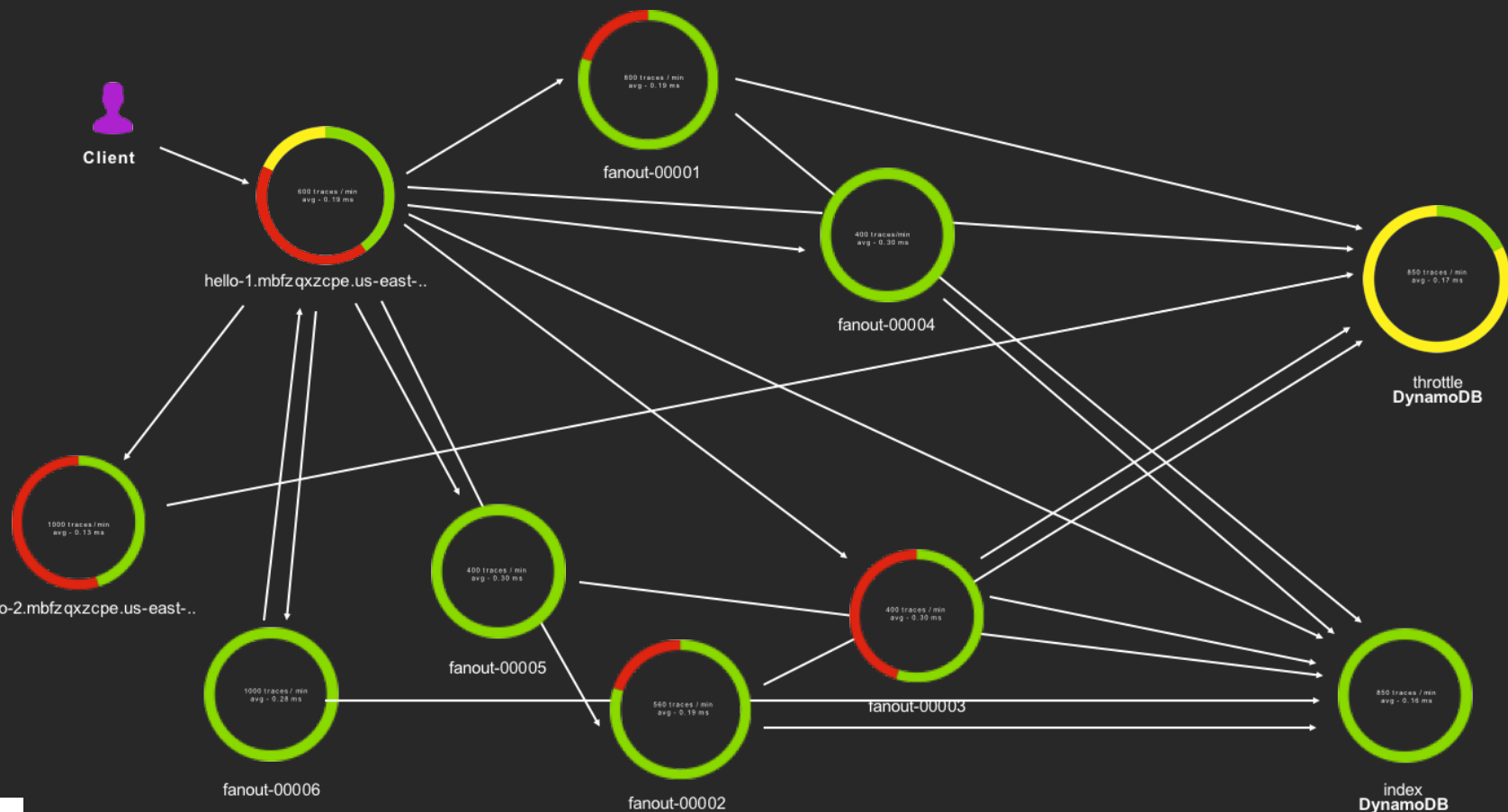
```
1  var AWSXRay = require('aws-xray-sdk-core');
2  var AWS = AWSXRay.captureAWS(require('aws-sdk'));
3  s3 = new AWS.S3({signatureVersion: 'v4'});
4
5  exports.handler = (event, context, callback) => {
6
7      var params = {Bucket: 'tim-example-bucket', Key: 'MyKey', Body: 'Hello!'};
8
9      s3.putObject(params, function(err, data) {});
10 }
```

AWS X-Ray

Profile and troubleshoot serverless applications:

- Lambda instruments incoming requests for all supported languages and can capture calls made in code
- API Gateway inserts a tracing header into HTTP calls as well as reports data back to X-Ray itself

```
var AWSXRay = require('aws-xray-sdk-core');  
var AWS = AWSXRay.captureAWS(require('aws-sdk'));  
S3Client = AWS.S3();
```

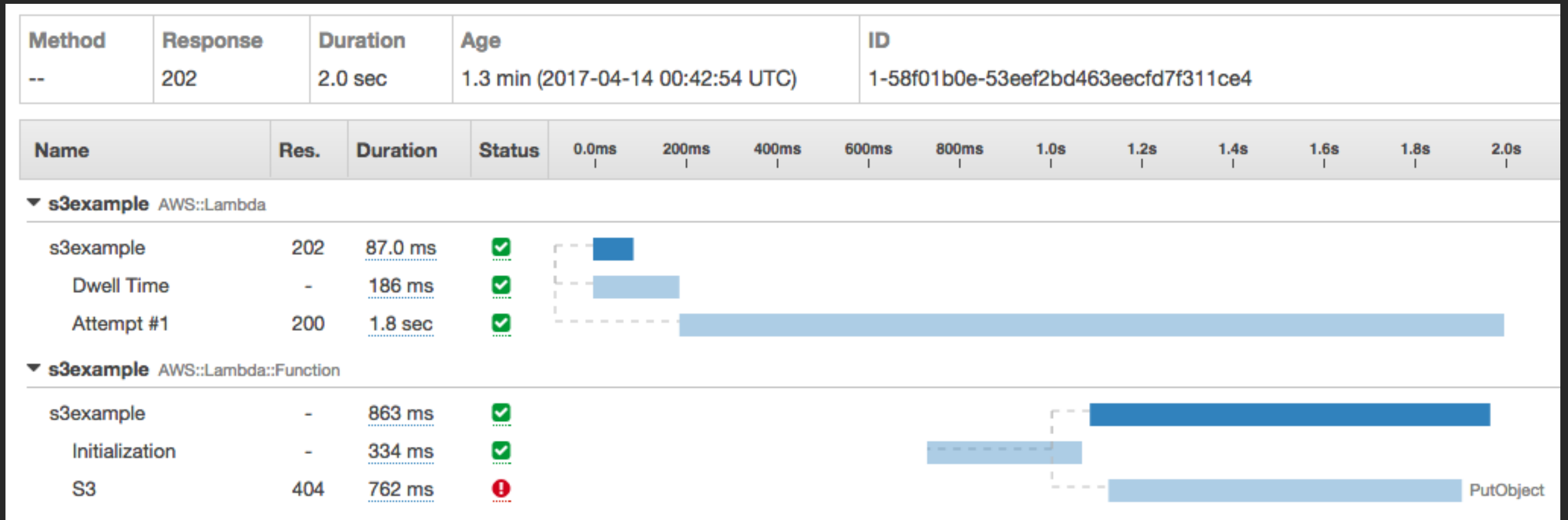


Enable X-Ray Tracing

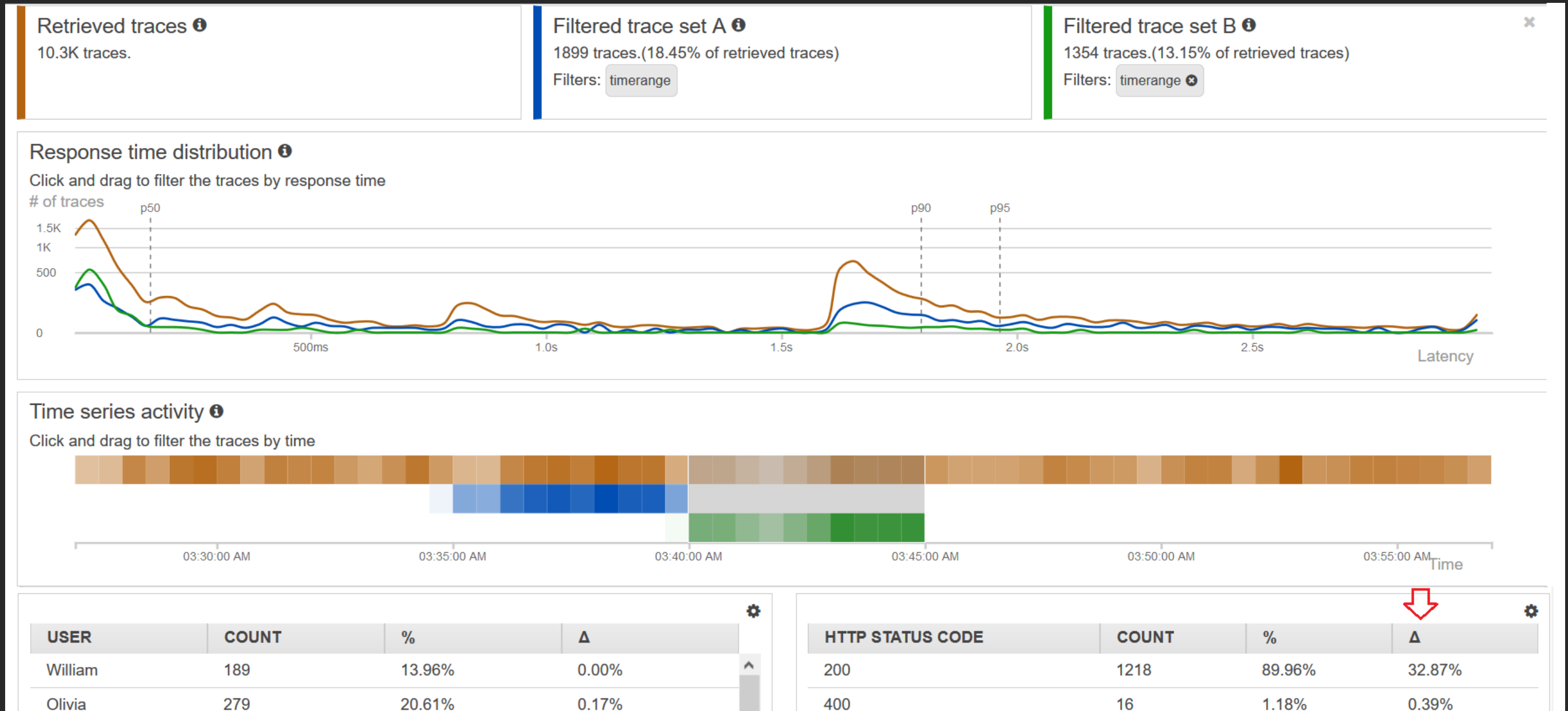
Enable active tracing [Info](#)



X-Ray trace example



AWS X-Ray analytics example



Amazon Elasticsearch Service (Amazon ES)

Amazon ES is a database

1

Send data as JSON via REST APIs

2

Data is indexed—
all fields searchable,
including nested JSON

3



Queries, via REST APIs,
allow fielded matching,
Boolean expressions,
include sorting and analysis

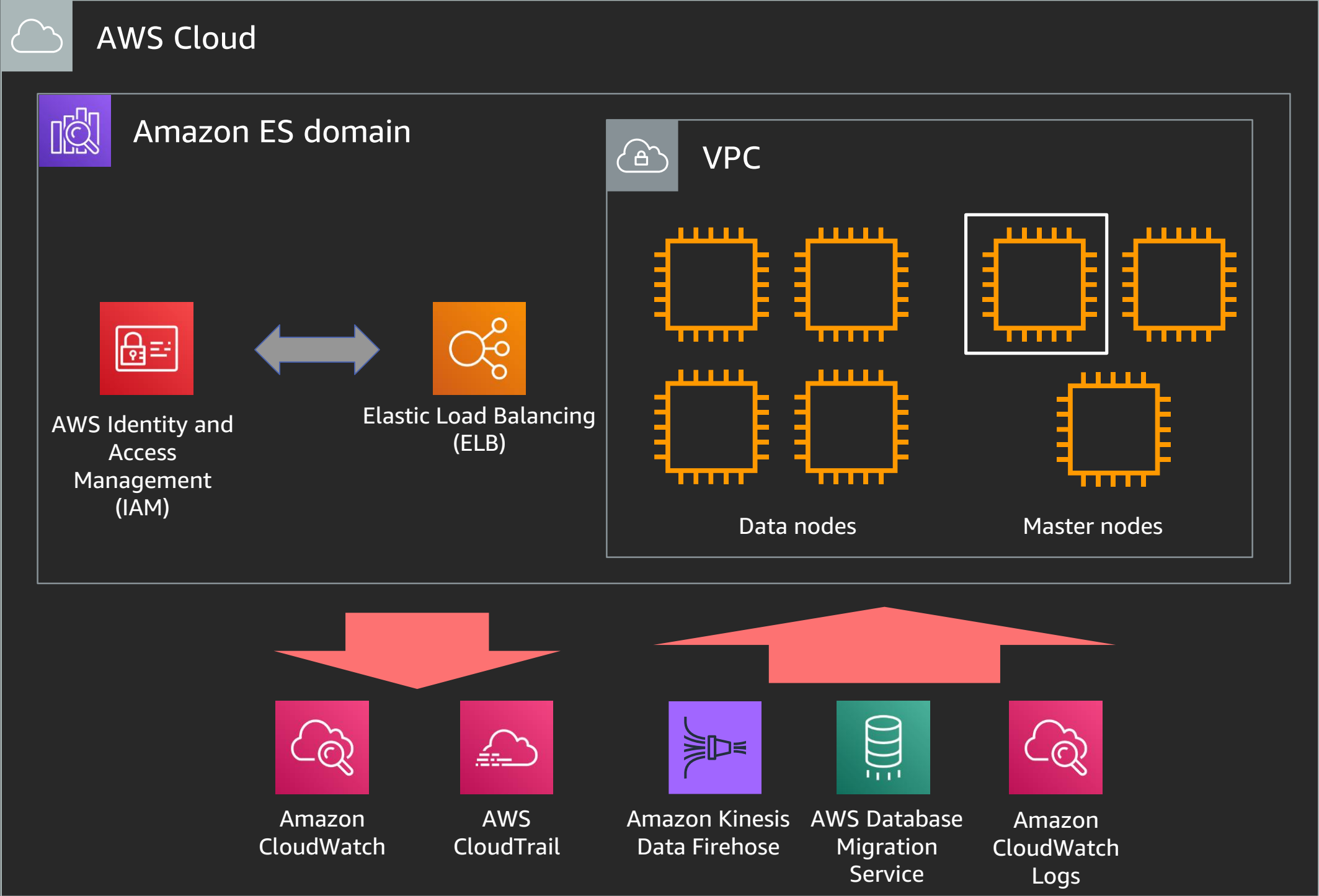




Amazon ES is a **fully managed service** that makes it easy to deploy, manage, and scale Elasticsearch and Kibana

Service architecture

- 
AWS Management Console
- 
AWS Command Line Interface (AWS CLI)
- 
AWS tools and SDKs
- 
AWS CloudFormation



You use the indexing APIs to send data to Amazon ES*

POST endpoint/index/type/id

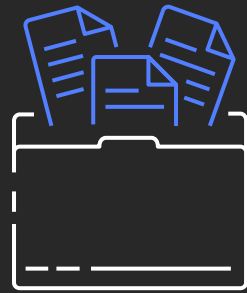
```
{  
  Document  
}
```

POST endpoint/index/_bulk

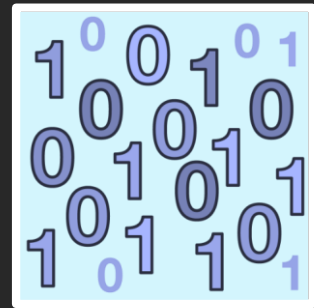
```
{ Command }  
{ Document }  
{ Command }  
{ Document }
```

* Your ingestion tools will probably automate this

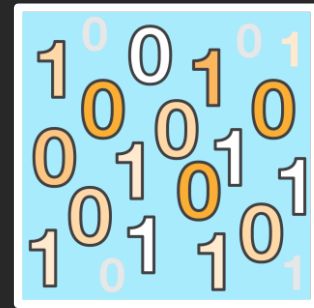
Data is stored in an index comprised of shards



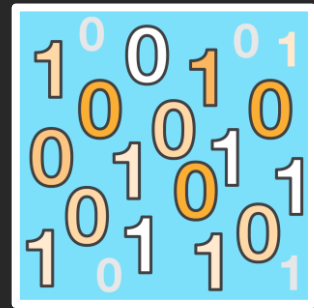
Index



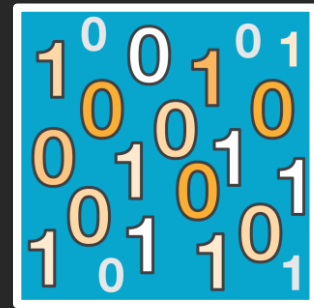
1/5



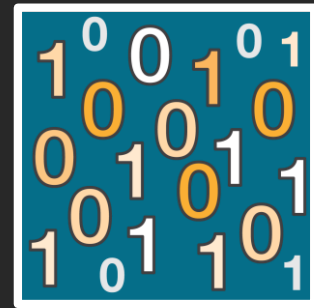
1/5



1/5



1/5



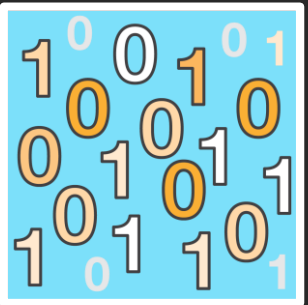
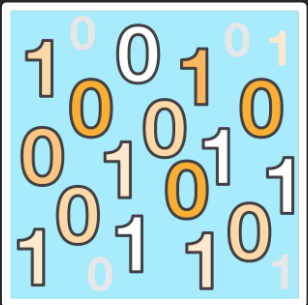
1/5



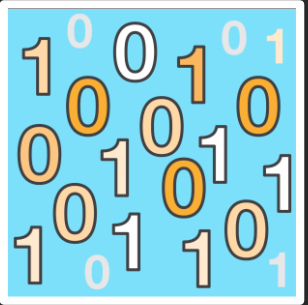
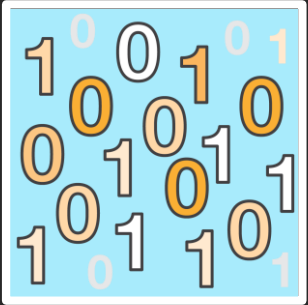
Shards are primary or replica



Index

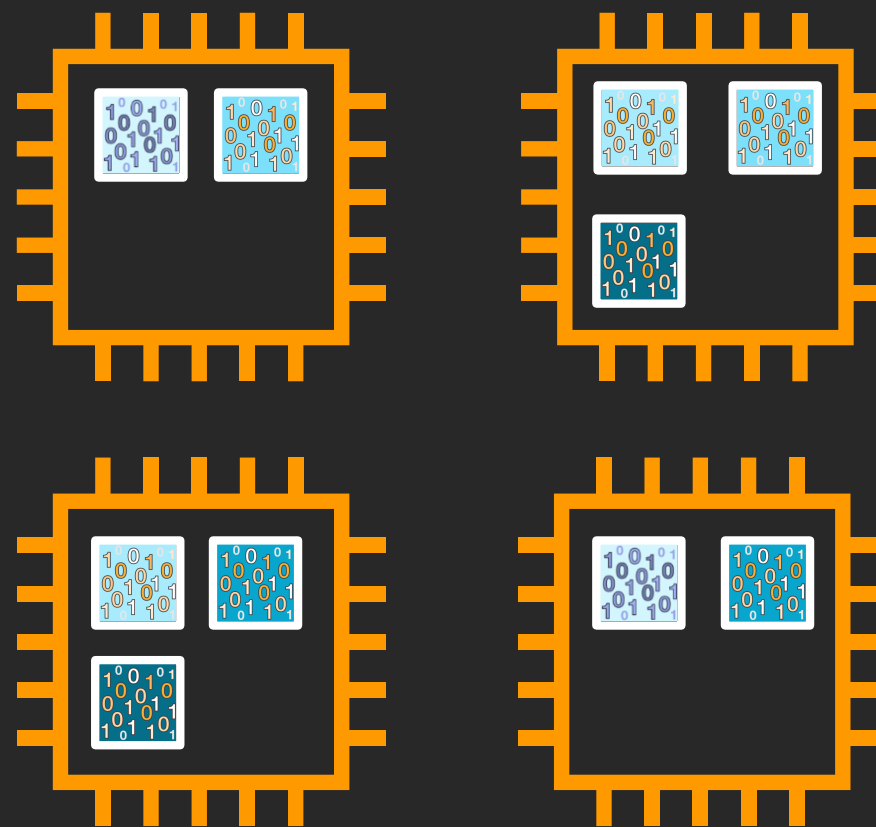
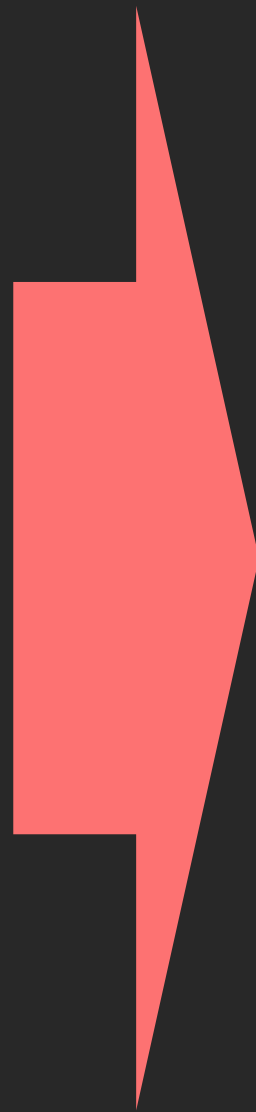
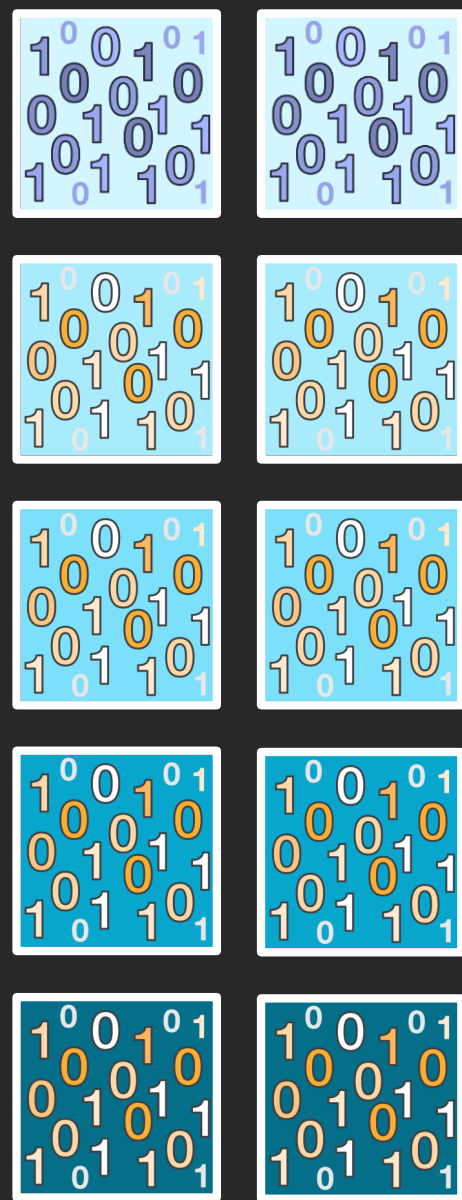


Primary shards



Replica shards

Amazon ES distributes shards to data nodes

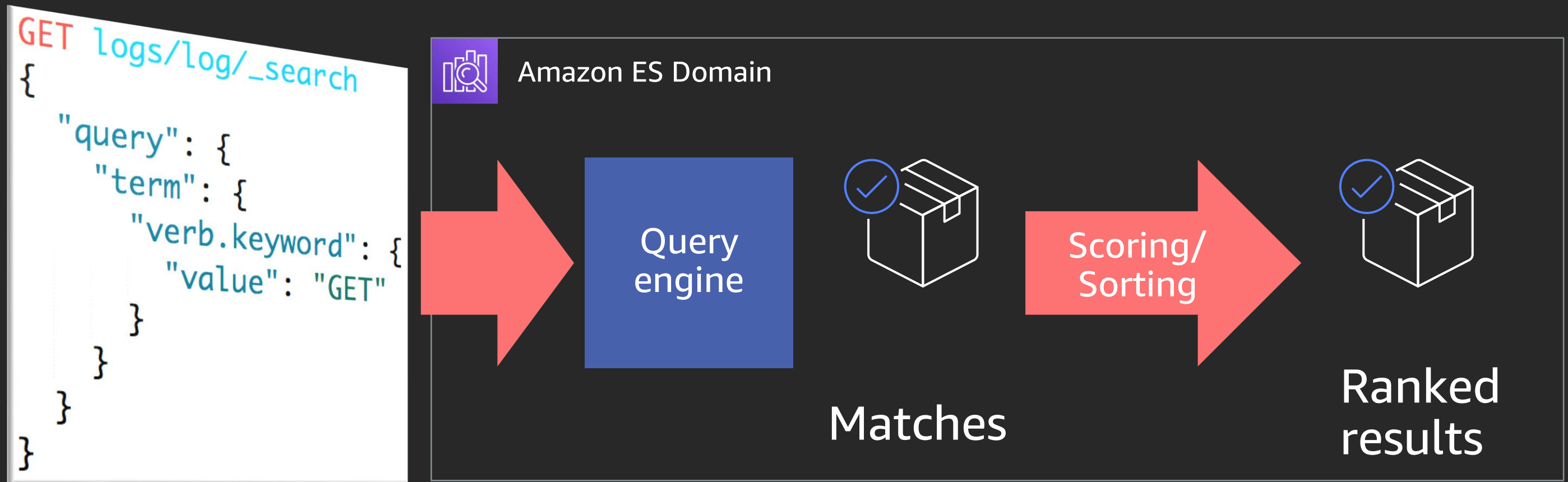


Queries



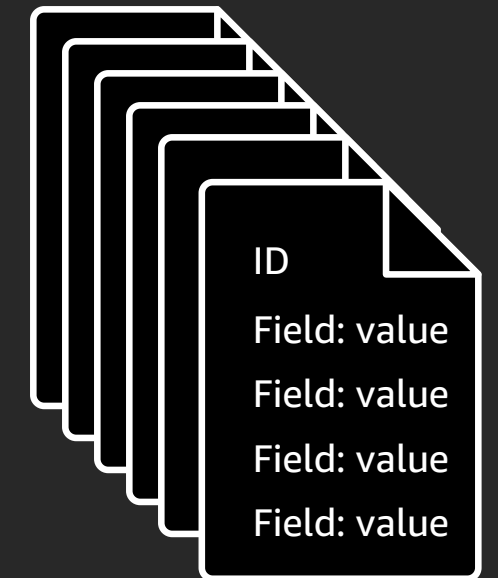
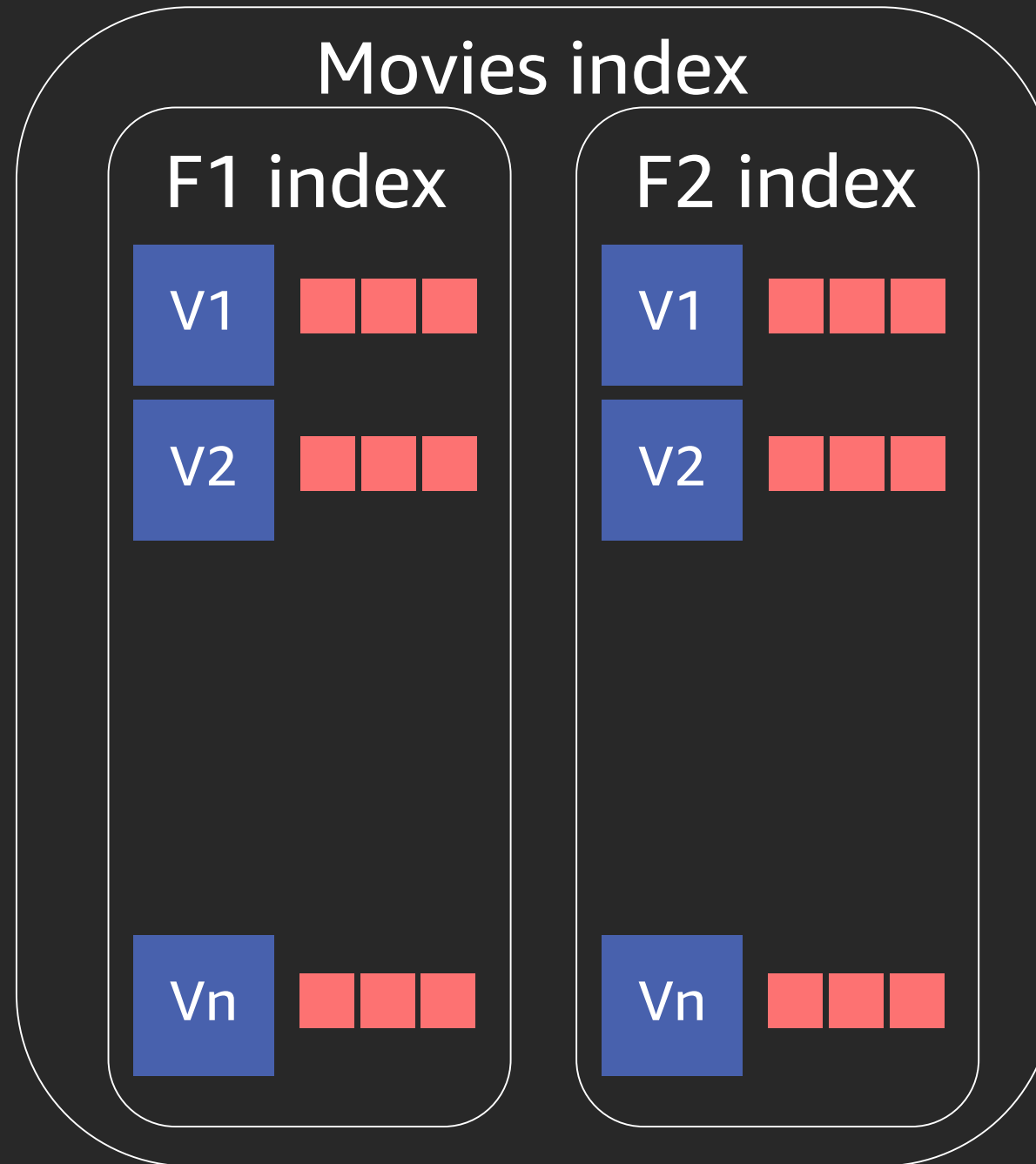
Updates

You use the query APIs to retrieve data from Amazon ES

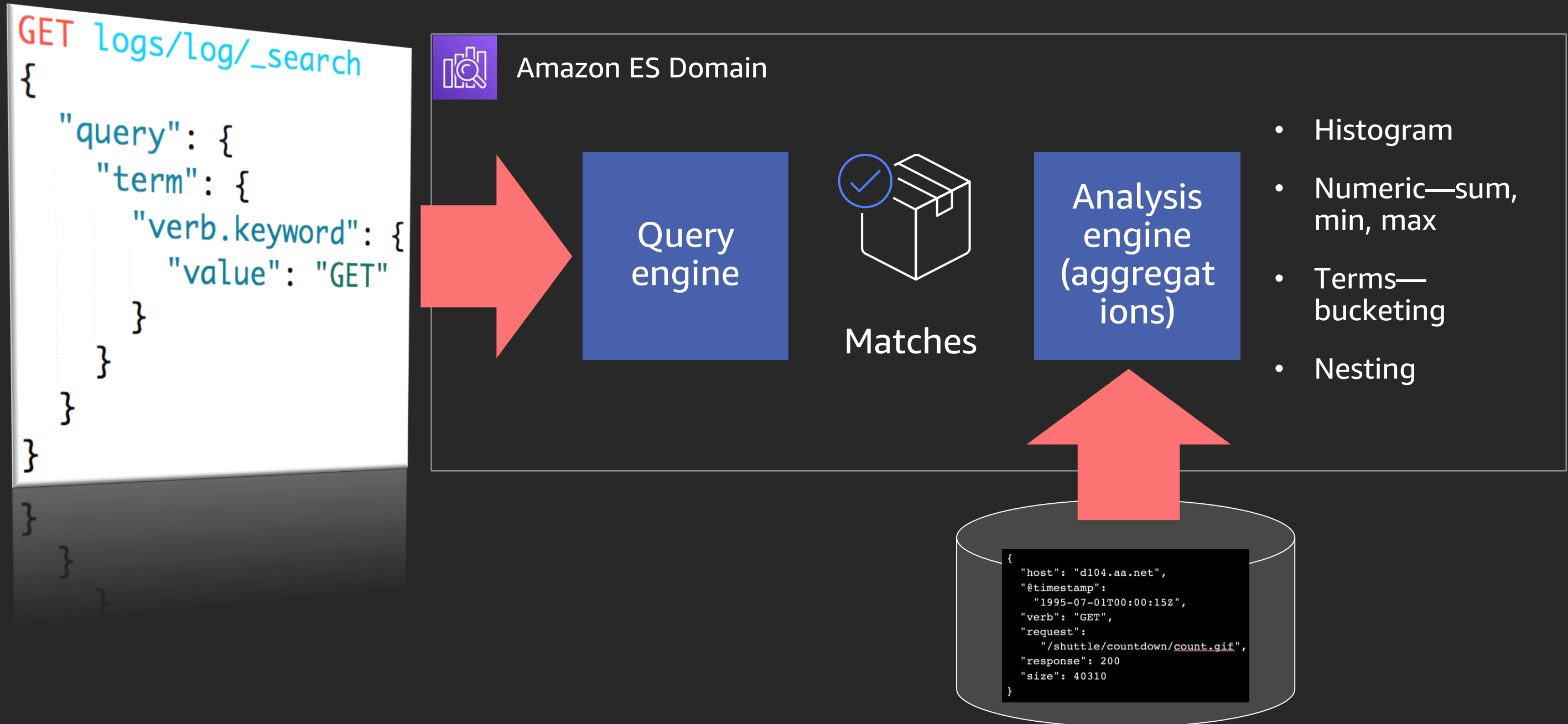


The query engine matches requested field values

Field1:value1
Field2:value2



You use aggregations to analyze log data



Amazon ES analysis with aggregations

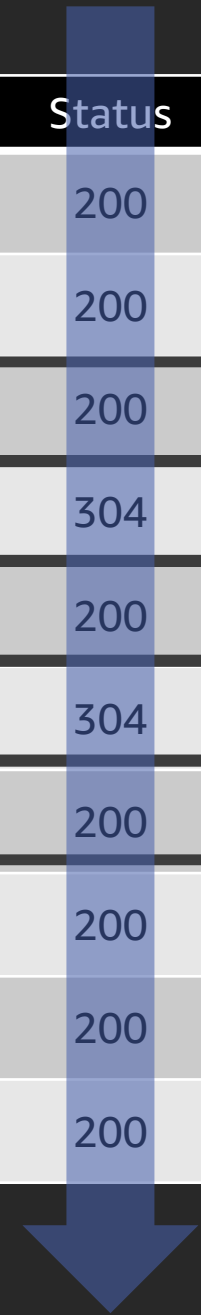
Host	Timestamp	Verb	Request	Http	Status	Size
199.72.81.55	[01/Jul/1995:00:00:01	GET	/history/apollo/	HTTP/1.0	200	6245
unicomp6.unicomp.net	[01/Jul/1995:00:00:06	GET	/shuttle/countdown/	HTTP/1.0	200	3985
199.120.110.21	[01/Jul/1995:00:00:09	GET	/shuttle/missions/sts-73/mission-sts-73.html	HTTP/1.0	200	4085
burger.letters.com	[01/Jul/1995:00:00:11	GET	/shuttle/countdown/liftoff.html	HTTP/1.0	304	0
199.120.110.21	[01/Jul/1995:00:00:11	GET	/shuttle/missions/sts-73/sts-73-patch-small.gif	HTTP/1.0	200	4179
burger.letters.com	[01/Jul/1995:00:00:12	GET	/images/NASA-logosmall.gif	HTTP/1.0	304	0
burger.letters.com	[01/Jul/1995:00:00:12	GET	/shuttle/countdown/video/livevideo.gif	HTTP/1.0	200	0
205.212.115.106	[01/Jul/1995:00:00:12	GET	/shuttle/countdown/countdown.html	HTTP/1.0	200	3985
d104.aa.net	[01/Jul/1995:00:00:13	GET	/shuttle/countdown/	HTTP/1.0	200	3985
129.94.144.152	[01/Jul/1995:00:00:13	GET	/	HTTP/1.0	200	7074

Filter: host="burger*" OR host="199.120*"

Host	Timestamp	Verb	Request	Http	Status	Size
199.72.81.55	[01/Jul/1995:00:00:01	GET	/history/apollo/	HTTP/1.0	200	6245
unicomp6.unicomp.net	[01/Jul/1995:00:00:06	GET	/shuttle/countdown/	HTTP/1.0	200	3985
199.120.110.21	[01/Jul/1995:00:00:09	GET	/shuttle/missions/sts-73/mission-sts-73.html	HTTP/1.0	200	4085
burger.letters.com	[01/Jul/1995:00:00:11	GET	/shuttle/countdown/liftoff.html	HTTP/1.0	304	0
199.120.110.21	[01/Jul/1995:00:00:11	GET	/shuttle/missions/sts-73/sts-73-patch-small.gif	HTTP/1.0	200	4179
burger.letters.com	[01/Jul/1995:00:00:12	GET	/images/NASA-logosmall.gif	HTTP/1.0	304	0
burger.letters.com	[01/Jul/1995:00:00:12	GET	/shuttle/countdown/video/livevideo.gif	HTTP/1.0	200	0
205.212.115.106	[01/Jul/1995:00:00:12	GET	/shuttle/countdown/countdown.html	HTTP/1.0	200	3985
d104.aa.net	[01/Jul/1995:00:00:13	GET	/shuttle/countdown/	HTTP/1.0	200	3985
129.94.144.152	[01/Jul/1995:00:00:13	GET	/	HTTP/1.0	200	7074

Aggregate: Status histogram

Host	Timestamp	Verb	Request	Http	Status	Size
199.72.81.55	[01/Jul/1995:00:00:01	GET	/history/apollo/	HTTP/1.0	200	6245
unicomp6.unicomp.net	[01/Jul/1995:00:00:06	GET	/shuttle/countdown/	HTTP/1.0	200	3985
199.120.110.21	[01/Jul/1995:00:00:09	GET	/shuttle/missions/sts-73/mission-sts-73.html	HTTP/1.0	200	4085
burger.letters.com	[01/Jul/1995:00:00:11	GET	/shuttle/countdown/liftoff.html	HTTP/1.0	304	0
199.120.110.21	[01/Jul/1995:00:00:11	GET	/shuttle/missions/sts-73/sts-73-patch-small.gif	HTTP/1.0	200	4179
burger.letters.com	[01/Jul/1995:00:00:12	GET	/images/NASA-logosmall.gif	HTTP/1.0	304	0
burger.letters.com	[01/Jul/1995:00:00:12	GET	/shuttle/countdown/video/livevideo.gif	HTTP/1.0	200	0
205.212.115.106	[01/Jul/1995:00:00:12	GET	/shuttle/countdown/countdown.html	HTTP/1.0	200	3985
d104.aa.net	[01/Jul/1995:00:00:13	GET	/shuttle/countdown/	HTTP/1.0	200	3985
129.94.144.152	[01/Jul/1995:00:00:13	GET	/	HTTP/1.0	200	7074



Aggregate: Size sum

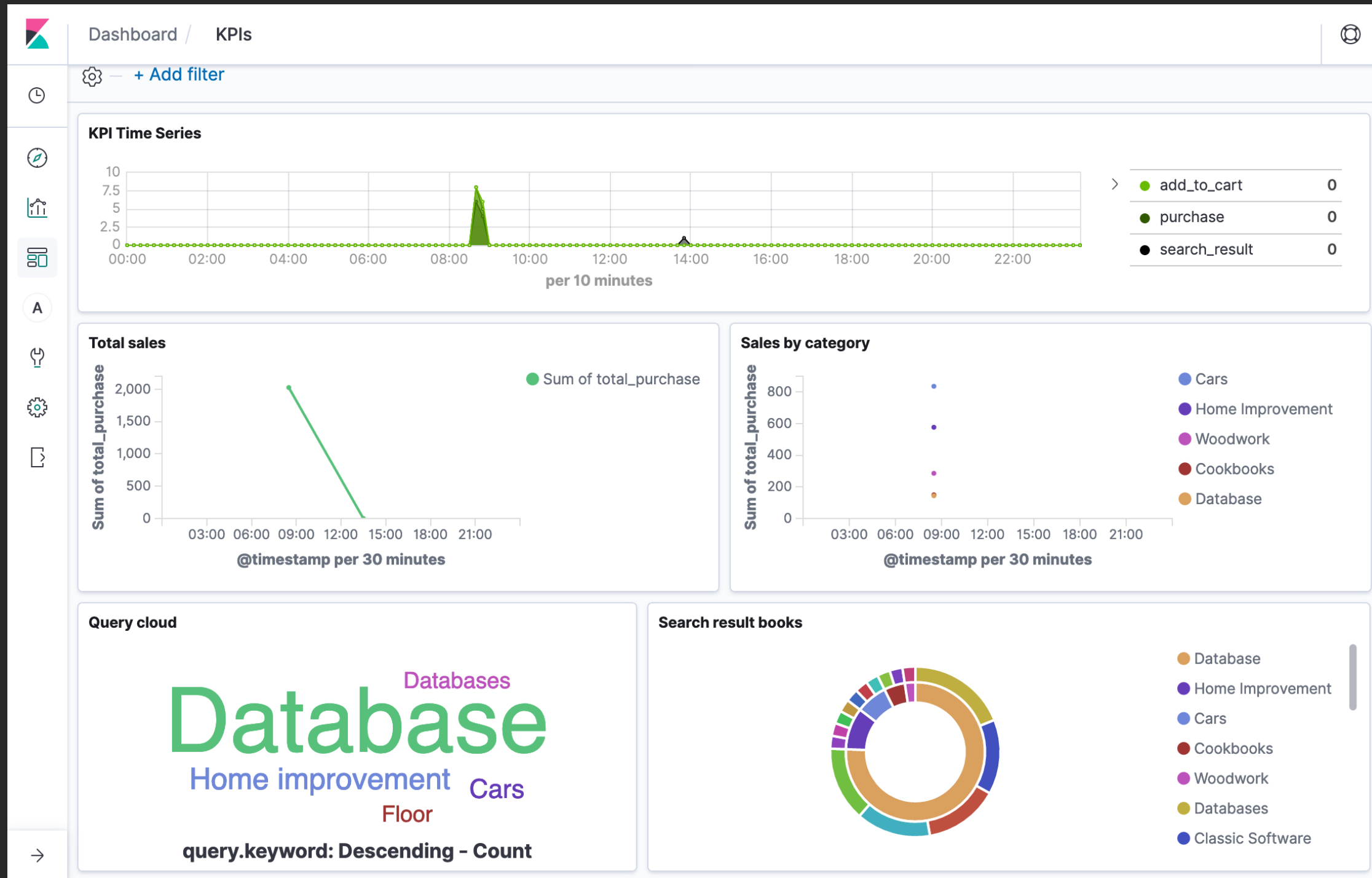
Host	Timestamp	Verb	Request	Http	Status	Size
199.72.81.55	[01/Jul/1995:00:00:01	GET	/history/apollo/	HTTP/1.0	200	6245
unicomp6.unicomp.net	[01/Jul/1995:00:00:06	GET	/shuttle/countdown/	HTTP/1.0	200	3985
199.120.110.21	[01/Jul/1995:00:00:09	GET	/shuttle/missions/sts-73/mission-sts-73.html	HTTP/1.0	200	4085
burger.letters.com	[01/Jul/1995:00:00:11	GET	/shuttle/countdown/liftoff.html	HTTP/1.0	304	0
199.120.110.21	[01/Jul/1995:00:00:11	GET	/shuttle/missions/sts-73/sts-73-patch-small.gif	HTTP/1.0	200	4179
burger.letters.com	[01/Jul/1995:00:00:12	GET	/images/NASA-logosmall.gif	HTTP/1.0	304	0
burger.letters.com	[01/Jul/1995:00:00:12	GET	/shuttle/countdown/video/livevideo.gif	HTTP/1.0	200	0
205.212.115.106	[01/Jul/1995:00:00:12	GET	/shuttle/countdown/countdown.html	HTTP/1.0	200	3985
d104.aa.net	[01/Jul/1995:00:00:13	GET	/shuttle/countdown/	HTTP/1.0	200	3985
129.94.144.152	[01/Jul/1995:00:00:13	GET	/	HTTP/1.0	200	7074



Aggregate: Request terms

Host	Timestamp	Verb	Request	Http	Status	Size
199.72.81.55	[01/Jul/1995:00:00:01	GET	/history/apollo/	HTTP/1.0	200	6245
unicomp6.unicomp.net	[01/Jul/1995:00:00:06	GET	/shuttle/countdown/	HTTP/1.0	200	3985
199.120.110.21	[01/Jul/1995:00:00:09	GET	/shuttle/missions/sts-73/mission-sts-73.html	HTTP/1.0	200	4085
burger.letters.com	[01/Jul/1995:00:00:11	GET	/shuttle/countdown/liftoff.html	HTTP/1.0	304	0
199.120.110.21	[01/Jul/1995:00:00:11	GET	/shuttle/missions/sts-73/sts-73-patch-small.gif	HTTP/1.0	200	4179
burger.letters.com	[01/Jul/1995:00:00:12	GET	/images/NASA-logosmall.gif	HTTP/1.0	304	0
burger.letters.com	[01/Jul/1995:00:00:12	GET	/shuttle/countdown/video/livevideo.gif	HTTP/1.0	200	0
205.212.115.106	[01/Jul/1995:00:00:12	GET	/shuttle/countdown/countdown.html	HTTP/1.0	200	3985
d104.aa.net	[01/Jul/1995:00:00:13	GET	/shuttle/countdown/	HTTP/1.0	200	3985
129.94.144.152	[01/Jul/1995:00:00:13	GET	/	HTTP/1.0	200	7074

Use dashboards to monitor in real time



Thank you!

Jon Handler and Safeer Mohiuddin



Please complete the session survey in the mobile app.