**Theoretical Part**

Now we would like to collect usage-log, of our API (in your service), as used by our users.

* We want to log all requests, even if they had failed
* We want to be able to identify the order of which a specific user, used our API (assume that there is an authentication mechanism)
* We may have multiple instances of the server you created.
* In the future we would want to run analytics over those logs, so it would be a nice benefit to have easy and simple access to them

##### Questions, answer in your words:

* How would you implement it? where would you store it?

We can create new Index in ES that responsible for logs or use the exist one. Each request will be documented in this index by using logging handler such as CMREShandler or explicity by using ES functions.

In order to identify the order of a specific user used the API we can export the route API name, the user ID, timestamp, request status, time handling, CPU usage of the request and more desired fields. The users can be stored in another Index or in another DB like Redis or MSSQL with their personal information and can be authenticated using those data bases.

Elasticsearch and Kibana can display results under filtering conditions, easy access, run analytics and more.

* What would you do differently in a much larger scale of data and usage?

One suggestion is to use storage service like AWS S3 which we can optimize, organize, and configure access to our data. Moreover, storage service providers offer scalability, data availability, security, and performance. We can use AWS S3 to store and retrieve any amount of data at any time.

Another suggestion is ELK Stack. Logstash is one of the ETL tools we can use - a light-weight, open-source, server-side data processing pipeline that allows you to collect data from a variety of sources, transform it on the fly, and then sends it to a "stash" like Elasticsearch. In addition, to use Kibana to display and filter the documents.

Example of scalable architecture:

Kibana

S3

Authentication

Logstash

ElasticSearch

DB

App

App

App

As we can see, the application can be scale out in a safe way, publishing data and logs to S3 and then Logstash can arrange all the data into ES “stash” and display it with Kibana.