**Spring Framework**

Initially, I studied about Java and banking Industry. I learned what and how banking works and how as a developer I can contribute here. I studied basics of JAVA and some concepts of spring framework. Then I studied the spring boot framework, which is built on top of spring framework. Spring framework helps the developers to build stand-alone, production-ready projects fast.

**Spring Boot Project**

We can either develop a spring boot application in eclipse or use STS (spring tool suite). In this project I used eclipse. Two classes were created.

'User.java' in spring boot with two fields, 'id' and 'name'.

Then I created a controller class named 'ElkStackExampleApplication.java'. Then I wrote a function which will return list of objects for the user.

Then from controller, based on the id, I fetched the user from the list. If there is no user object with that id, return null and throw exception. This will produce the error as well as the success result in the kibana console.

Now I generated a log file of this application using logger.info() and logger.error().

To generate log file in logstash, I went to application.yml file and typed their 'logging' and specified the file and gave file path of logs and give name of log-file, 'elk-stack.log'.

**Spring annotations used**

* Spring @**RestController** annotation is used to create RESTful web services using Spring MVC. Spring **RestController** takes care of mapping request data to the defined request handler method.
* @**GetMapping** annotation maps HTTP GET requests onto specific handler methods. It is a composed annotation that acts as a shortcut for @RequestMapping(method = RequestMethod. GET) .

**Rest API**

REST or [RESTful API](https://www.mulesoft.com/resources/api/restful-api" \o "RESTful API) design (Representational State Transfer) is designed to take advantage of existing protocols. While REST can be used over nearly any protocol, it usually takes advantage of HTTP when used for Web APIs. This means that developers do not need to install libraries or additional software in order to take advantage of a REST API design.

**Verifying application**

Copy the URL 'get\_user'. Check the port form application.yml file, which is 9898 in this case. Type 'localhost:9898/get\_user/3'. If we have user id, it will display in browser. If we type a user id which is not present, the console will show exception with the error message.

Now verify whether log is generated or not in the logs folder.

**Logstash**

Now configure the logstash, to push the entire generated log to logstash.

Go to logstash folder, go to bin, and run the logstash batch file.

Download and unzip the logstash. Then create a 'logstash.conf' file. Inside that config file, we need to tell out logstash, where our log-file is located.

In 'logstash.conf', give inout, filter and output. In input, specify the file path and start\_position as 'begginning'. In output section, we are giving the log from specified path of input to elasticsearch. Mention the elasticsearch host port there, which is 9200.

Copy this conf file into bin folder of logstash and paste file. Now type command and run the 'logstash.bat' file. Then give file name, which is 'logstash.conf'. The command is 'logstash -f logstash.conf'.

There you can get the logstash running port, '9600'. Now try to hit the API and get user info, with valid and invalid id's.

In logstash console, you will be able to see logs with timestamp.

Go to browser. Type 'localhost:9200/cat', to verify indexes. There you will find 'indices'. Type it as 'localhost:9200/cat/indices', there you will find index internally created by elk.

For logging purpose, the logstash with current time-stamp was created. You can view that content in kibana console. Copy that, and give that index 'localhost:9200/logstash-202004-05-000001' and seacrh it. You will see logs.

**Elasticseacrh**

First download the three components which are elasticseach, logstash and kibana.

Go the downloaded folder. Go to bin. There will be a batch file, named elasticseach.bat.

Type 'cmd' to run that. In promt type 'elasticsearch.bat'. It will take a couple of second to up the nosql elasticsearch database.

**Kibana**

Now go to kibana folder. Go to the config folder. Open 'kibana.yml' file to configure.

Scroll down a bit. There you will find a localhost line. Uncomment that line. We want to inform kibana where our elasticsearch is running.

Now go to bin folder. There will be a 'kibana.bat' batch file. Open command prompt and run kibana.bat in it.

To verify elasticsearch, go to browser and type 9200 localhost. There you will see a response.

To verify kibana console, check in prompt it's port no. and go to browser. There you will see an interactive kibana dashboard.

Now go to kibana and create index pattern with the same index. To create your own index, you need to make changes in 'logstash.conf' file, by giving index in output folder.

Now go to kibana console to create index pattern. Go to management. Click on 'create an index pattern'. Give your index name which is current time stamp index. You may or may not enable the time filter. Now will be able to see all logs in kibana console.

Click on 'Discover'. There you will see your index pattern.