8.4 Software Architecture: Homework

Task 1

Around the beginning of the second ten days of July a problem first appeared in the application. When a user tries to sign in to the application nothing happens. It's known the problem is on the server side. You don't know what is the application server-side architecture. But you have logs. Your task is to read logs and

- 1. Create a diagram describing the application server-side architecture (the same way it was done in the textbook)
- 2. Find the log entries that refer to the issue in the log file(s) and supply your suggestion with a short text that describes why you think the log entries indicate the actual issue.

(Logs are attached to this HW as files)

Read the sandbox documentation in order to figure out how to:

- set up VPN
- connect via SSH to the sandbox server
- restart the sandbox app
- access and read sandbox application logs
- access your own application (on the specific port)

Task 2

Experiment with your own instance of Java-FTB application on ***.***.*** (ensure it's running beforehand, and start it if needed):

• Change file access permissions on '/apps/java/ftb/\$USER/application.properties' to prevent anyone from accessing this file.

chmod 000 /apps/java/ftb/\$USER/application.properties

Restart the service. Veryfiy the application failed to run on ***.***.***:\$YOUR_PORT.

In your submission provide its logs as a screenshot with the evidence of start failure.

• Fix this issue by returning the permissions to the original state:

chmod 700 /apps/java/ftb/\$USER/application.properties

Restart the service, and show its logs with successful results (only the last 5-10 lines saying "Started FlightticketbookingApplication" are required).

In your submission provide its logs as a screenshot with the evidence of start failure.

Task 3

Continue the experimenting with the FTB service:

1. Using a text editor (f.e. nano) Change the MySQL port in "application.properties" configuration file from 3306 to 3307, then restart the service. Example:

nano /apps/java/ftb/\$USER/application.properties

- 2. Look at its recent log messages and find out which lines can point you to connectivity issues
- 3. Fix it, then restart
- 4. In your submission provide the logs with successful restart results

Task 1

Around the beginning of the second ten days of July a problem first appeared in the application. When a user tries to sign in to the application nothing happens. It's known the problem is on the server side. You don't know what is the application server-side architecture. But you have logs. Your task is to read logs and

1. Create a diagram describing the application server-side architecture (the same way it was done in the textbook)

We can understand from the task and from log file that:

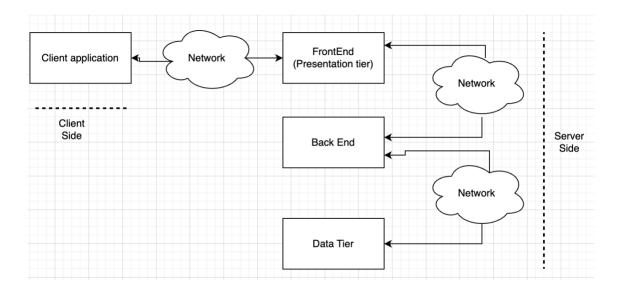
There is UI (log-in form),

Used node (frontend),

There are java .js (backend) and server+port: ***.***.***.***

There will be also database.

Thus we have 3-tier application:



2. Find the log entries that refer to the issue in the log file(s) and supply your suggestion with a short text that describes why you think the log entries indicate the actual issue. (Logs are attached to this HW as files)

The log entries that refer to the issue is frontend.log.txt.

We have the information about date when a problem first appeared in the applicatin – it is around the beginning of the second ten days of July.

We can see **Jul 11** just in frontend.log.txt.

Jul 11 17:15:19 c7-sandbox npm[31824]: Cookies: [Object: null prototype] {}

We also can see in log file information about login and password (user tries to sign in to the application) and next to it error message (nothing happens when a user tries to sign in to the application).

Also known that the problem appeared not once, I see in the log identical problem 3 times (Jul 11 17:15:19, Jul 11 17:15:27 and Jul 11 17:15:32):

Jul 11 17:15:19 c7-sandbox npm[31824]: { login: 'root', password: '1234' }

Jul 11 17:15:19 c7-sandbox npm[31824]: (node:31835) UnhandledPromiseRejectionWarning: Error: connect

ECONNREFUSED ***.***.***.****

Jul 11 17:15:19 c7-sandbox npm[31824]: at TCPConnectWrap.afterConnect [as oncomplete] (net.js:1159:16)

Jul 11 17:15:19 c7-sandbox npm[31824]: (Use `node --trace-warnings ...` to show where the warning was created)

Jul 11 17:15:19 c7-sandbox npm[31824]: (node:31835) UnhandledPromiseRejectionWarning: Unhandled promise rejection. This error originated either by throwing inside of an async function without a catch block, or b

Jul 11 17:15:19 c7-sandbox npm[31824]: (node:31835) [DEP0018] DeprecationWarning: Unhandled promise rejections are deprecated. In the future, promise rejections that are not handled will terminate the Node.js pr

Experiment with your own instance of Java-FTB application on ***.***.*** (ensure it's running beforehand, and start it if needed):

 Change file access permissions on '/apps/java/ftb/\$USER/application.properties' to prevent anyone from accessing this file. chmod 000 /apps/java/ftb/\$USER/application.properties

I've started command: chmod 000 /apps/java/ftb/\$USER/application.properties

Then checked that I've changed file permission: cat application.properties

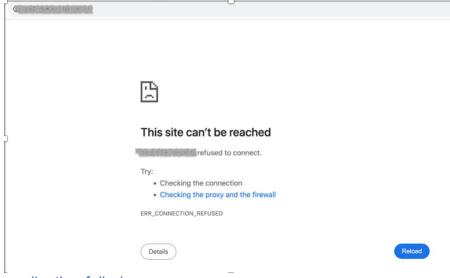
cat: application.properties: Permission denied

```
[nkhaytovich@c7-backend nkhaytovich]$ chmod 000 /apps/java/ftb/$USER/application.properties
[nkhaytovich@c7-backend nkhaytovich]$ pwd
/apps/java/ftb/nkhaytovich
[nkhaytovich@c7-backend nkhaytovich]$ ls -l
total 20
-rw-r--r--. 1 nkhaytovich qa 2374 Nov 30 21:31 FTB.2023-11-30.log
-rw-r--r--. 1 nkhaytovich qa 2012 Dec 7 17:27 FTB.2023-12-07.log
-rw-r--r--. 1 nkhaytovich qa 2166 Dec 10 11:30 FTB.log
-----------. 1 nkhaytovich qa 1424 Oct 4 21:15 application.properties
lrwxrwxrwx. 1 nkhaytovich qa 37 Oct 4 21:15 ftb.jar -> /apps/scripts/template/ftb-actual.jar
-rwx-----. 1 nkhaytovich qa 301 Oct 4 21:15 java-start-ftb.sh
[nkhaytovich@c7-backend nkhaytovich]$ cat application.properties
cat: application.properties: Permission denied
[nkhaytovich@c7-backend nkhaytovich]$
```

Restart the service. Veryfiy the application failed to run on ***.***.***:SYOUR PORT.

I've started command: sudo systemctl restart java-ftb.\$USER

Then checked that the



application failed

In log file I see that I've stopped FTB service.. journalctl -u java-ftb.\$USER

```
Dec 10 12:17:13 c7-backend systemd[1]: Stopping Flight ticket web service, per user..

Dec 10 12:17:13 c7-backend systemd[1]: Stopped Flight ticket web service, per user.

Dec 10 12:17:13 c7-backend systemd[1]: Storped Flight ticket web service, per user.

Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: 2023.12.10 12:17:14.008 [main] ERROR o.s.b.SpringApplication - Application run failed

Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: java.lang.IllegalStateException: T0 error on loading imports from [optional:file:./con dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.context.config.ConfigDataImporter.resolveAndLoad(ConfigDataImporter.java:89 dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.context.config.ConfigDataEnvironment.ontributors.withProcessedImports(ConfigDec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.context.config.ConfigDataEnvironment.processInitial(ConfigDataEnvironment.processInitial(ConfigDataEnvironment.Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.context.config.ConfigDataEnvironment.processAndApply(ConfigDataEnvironment.Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.context.config.ConfigDataEnvironmentProcessOr.postProcessEnvironment(Co Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.context.config.ConfigDataEnvironmentPostProcessor.postProcessEnvironment(Co Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.context.config.ConfigDataEnvironmentPostProcessOr.postProcessEnvironment(Co Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.context.config.ConfigDataEnvironmentPostProcessOr.postProcessEnvironmentPostProcessOr.postProcessEnvironment(Co Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.context.config.ConfigDataEnvironmentPostProcessOr.postProcessEnvironmentPostProcessOr.postProcessEnvironme
```

Here I see also the reason:

```
Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.SpringApplication.run(SpringApplication.java:130b)
Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.SpringApplication.run(SpringApplication.java:1295)
Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke(Native MethodAccessorImpl.invoke(Native MethodAccessorImpl.java:77)
Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:77)
Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:77)
Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at java.base/jdx.internal.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at java.base/java.lang.reflect.Method.invoke(Method.java:568)
Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.loader.MainMethodRunner.run(MainMethodRunner.java:49)
Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.loader.Launcher.launch(Launcher.java:58)
Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.loader.JarLauncher.launcher.java:58)
Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.loader.JarLauncher.java:58)
Dec 10 12:17:14 c7-backend java-start-ftb.sh[15136]: at org.springframework.boot.loader.JarLauncher.java:56)
```

• Fix this issue by returning the permissions to the original state: chmod 700 /apps/java/ftb/\$USER/application.properties

Started command:

chmod 700 /apps/java/ftb/\$USER/application.properties

Checked that I've changed file permission:

Restart the service, and show its logs with successful results (only the last 5-10 lines saying "Started FlightticketbookingApplication" are required).

Then I've restarted the service: sudo systemctl restart java-ftb.\$USER

Then checked that the application – it works:

Welcome to Aero Travel website!

Aero Travels is an airline reservation company.

It has numbers of branches spread across the world. A person who wants to reserve a flight ticket mus flight operations manually, but as its customers grow in number, managing flight operations manually be automated system. The Flight Ticket Booking (FTB) provides a solution for online flight ticket booking. customers, and verify flight ticket. The system should be convenient and user-friendly.

The users include:

- · Admin who can add flight, cancel flight, add aircraft, remove aircraft, and add airport.
- Travel Agents who can search flight, book flight or cancel reservation for customer.
- · Customers who can search flights and verify their ticket in the system.

Customer information include first name, last name, Date of birth, gender, phone number, and address model, and type. A flight has an aircraft, flight number, departure time, departure airport, arrival airport passengers (customers) which is booked a ticked for that flight.

In log file I see that I've stopped FTB service.. journalctl -u java-ftb.\$USER

```
Dec 10 12:37:46 C7-backend java-start-ftb.sh[17026]: 2023.12.10 12:37:46.080 [background-preinit] INFO o.h.v.i.util.Version — HV000001: Hibernate Validator 6.2.3.Final Dec 10 12:37:46 C7-backend java-start-ftb.sh[17026]: 2023.12.10 12:37:46.080 [main] INFO c.a.f.FlightticketbookingApplication — Starting FlightticketbookingApplication — Working PlughtticketbookingApplication — Working Plughtticketbooking
```

Task 3

Continue the experimenting with the FTB service:

 Using a text editor (f.e. nano) Change the MySQL port in "application.properties" configuration file from 3306 to 3307, then restart the service. Example:

nano /apps/java/ftb/\$USER/application.properties

I've changed port from 3306 to 3307:

```
[nkhaytovich@c7-backend nkhaytovich]$ cat application.properties
  APPLICATION PROPERTIES
server.port=8112
  = Thymeleaf configurations (ThymeleafAutoConfiguration)
spring.thymeleaf.mode=HTML
spring.thymeleaf.cache=false
spring.thymeleaf.encoding=UTF-8
# = DATA SOURCE
##Using MySQL database
spring.datasource.url=jdbc:mysql://蠣
                                                    建筑地域等: 3307/電影
false&serverTimezone=UTC
spring.datasource.username=dbnkhaytovich
spring.datasource.password=
# = JPA / HIBERNATE
spring.jpa.show-sql=true
spring.jpa.hibernate.ddl-auto=update
spring.jpa.hibernate.naming.implicit-strategy=org.hibernate.boot.model.naming.ImplicitNamingStrategyJpaCompliantImpl
spring.jpa.properties.hibernate.dialect=org.hibernate.dialect.MySQL8Dialect
# Sources of Documentation
# https://docs.spring.io/spring-boot/docs/current/reference/html/common-application-properties.html
# https://www.thymeleaf.org/doc/tutorials/3.0/usingthymeleaf.html
#server.error.whitelabel.enabled=false
  Impediment
   ediment.delavs=true
```

Then restarted the service:

sudo systemctl restart java-ftb.\$USER

2. Look at its recent log messages and find out which lines can point you to connectivity issues

I think that the next lines can point to connectivity issues:

com.mysql.cj.exceptions.CJCommunicationsException: Communications link failure

```
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]:

com.mysql.cj.jdbc.exceptions.CommunicationsException:

Communications link failure

Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: The last packet sent successfully to the server was 0 milliseconds ago.

The driver has not received any packets from

Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: at

com.mysql.cj.jdbc.exceptions.SQLError.createCommunicationsException(SQLError.java:174)

Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: at

com.mysql.cj.jdbc.exceptions.SQLExceptionsMapping.translateException(SQLExceptionsMapping.java:64)

...

Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: Caused by:
```

```
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: The last packet sent successfully to the server was 0
milliseconds ago. The driver has not received any packets from
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: ... 57 common frames omitted
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: Caused by: java.net.ConnectException: Connection
refused
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: ... 60 common frames omitted
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: 2023.12.10 14:04:29.640 [main] WARN
o.h.e.j.e.i.JdbcEnvironmentInitiator - HHH000342: Could not obtain connection t
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]:
com.mysql.cj.jdbc.exceptions.CommunicationsException: Communications link failure
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: The last packet sent successfully to the server was 0
milliseconds ago. The driver has not received any packets from
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com.mysql.cj.jdbc.exceptions.SQLExceptionsMapping.translateException(SQLExceptionsMapping.java:64)
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: Caused by:
com.mysql.cj.exceptions.CJCommunicationsException: Communications link failure
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: The last packet sent successfully to the server was 0
milliseconds ago. The driver has not received any packets from
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: ... 57 common frames omitted
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: Caused by: java.net.ConnectException: Connection
refused
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: ... 60 common frames omitted
Dec 10 14:04:29 c7-backend java-start-ftb.sh[26698]: 2023.12.10 14:04:29.647 [main] INFO
o.h.dialect.Dialect - HHH000400: Using dialect: org.hibernate.dialect.MySQL8Dia
Dec 10 14:04:30 c7-backend java-start-ftb.sh[26698]: 2023.12.10 14:04:30.147 [main] INFO
c.z.h.HikariDataSource - HikariPool-1 - Starting...
```

```
Dec 10 14:04:31 c7-backend java-start-ftb.sh[26698]: 2023.12.10 14:04:31.149 [main] ERROR c.z.h.p.HikariPool - HikariPool-1 - Exception during pool initialization.

Dec 10 14:04:31 c7-backend java-start-ftb.sh[26698]: com.mysql.cj.jdbc.exceptions.CommunicationsException: Communications link failure

Dec 10 14:04:31 c7-backend java-start-ftb.sh[26698]: The last packet sent successfully to the server was 0 milliseconds ago. The driver has not received any packets from

Dec 10 14:04:31 c7-backend java-start-ftb.sh[26698]: at com.mysql.cj.jdbc.exceptions.SQLError.createCommunicationsException(SQLError.java:174)

Dec 10 14:04:31 c7-backend java-start-ftb.sh[26698]: at com.mysql.cj.jdbc.exceptions.SQLExceptionsMapping.translateException(SQLExceptionsMapping.java:64) ...

Dec 10 14:04:31 c7-backend java-start-ftb.sh[26698]: Caused by: java.net.ConnectException: Connection
```

(There are a lot such lines in a log file) There are lines with hibernate also..

refused

3. Fix it, then restart

nano /apps/java/ftb/\$USER/application.properties I've changed port from 3307 to 3306:

```
[nkhaytovich@c7-backend nkhaytovich]$ cat application.properties
   APPLICATION PROPERTIES
server.port=8112
# = Thymeleaf configurations (ThymeleafAutoConfiguration)
spring.thymeleaf.mode=HTML
spring.thymeleaf.cache=false
spring.thymeleaf.encoding=UTF-8
##Using MySQL database
spring.datasource.url=jdbc:mysql://

                                                           :3306/
spring.datasource.username=dbnkhaytovich
spring.datasource.password=
# = JPA / HIBERNATE
spring.jpa.show-sql=true
spring.jpa.hibernate.ddl-auto=update
spring.jpa.hibernate.ddl-auto=update
spring.jpa.hibernate.naming.implicit-strategy=org.hibernate.boot.model.naming.ImplicitNamingStrategyJpaCompliantImpl
spring.jpa.properties.hibernate.dialect=org.hibernate.dialect.MySQL8Dialect
# Sources of Documentation
# https://docs.spring.io/spring-boot/docs/current/reference/html/common-application-properties.html # https://www.thymeleaf.org/doc/tutorials/3.0/usingthymeleaf.html #server.error.whitelabel.enabled=false
```

Then restarted the service:

sudo systemctl restart java-ftb.\$USER

4. In your submission provide the logs with successful restart results

journalctl -u java-ftb.\$USER

Dec 10 14:28:38 c7-backend java-start-ftb.sh[29279]: 2023.12.10 14:28:38.923 [background-preinit] INFO o.h.v.i.util.Version - HV000001: Hibernate Validator 6.2.3.Final Dec 10 14:28:38 c7-backend java-start-ftb.sh[29279]: 2023.12.10 14:28:38.928 [main] INFO c.a.f.FlightticketbookingApplication - Starting FlightticketbookingApplication v0.0.95-SNAPSHOT us Dec 10 14:28:38 c7-backend java-start-ftb.sh[29279]: 2023.12.10 14:28:38.929 [main] INFO c.a.f.FlightticketbookingApplication - No active profile set, falling back to 1 default profile: "Dec 10 14:28:39 c7-backend java-start-ftb.sh[29279]: 2023.12.10 14:28:39.546 [main] INFO o.s.d.r.c.RepositoryConfigurationDelegate - Bootstrapping Spring Data JPA repositories in DEFAULT Dec 10 14:28:40 c7-backend java-start-ftb.sh[29279]: 2023.12.10 14:28:40.231 [main] INFO o.s.d.r.c.RepositoryConfigurationDelegate - Finished Spring Data repository scanning in 38 ms. Fou Dec 10 14:28:40 c7-backend java-start-ftb.sh[29279]: 2023.12.10 14:28:40.231 [main] INFO o.s.d.r.c.RepositoryConfigurationDelegate - Finished Spring Data repository scanning in 38 ms. Fou Dec 10 14:28:40 c7-backend java-start-ftb.sh[29279]: 2023.12.10 14:28:40.231 [main] INFO o.s.d.r.c.RepositoryConfigurationDelegate - Finished Spring Data repository scanning in 38 ms. Fou Dec 10 14:28:40 c7-backend java-start-ftb.sh[29279]: 2023.12.10 14:28:40.231 [main] INFO o.s.d.r.c.RepositoryConfigurationDelegate - Finished Spring Data repository scanning in 38 ms. Fou Dec 10 14:28:40 c7-backend java-start-ftb.sh[29279]: 2023.12.10 14:28:40.231 [main] INFO o.s.d.r.c.RepositoryConfigurationDelegate - Finished Spring Data repository scanning in 38 ms. Fou Dec 10 14:28:40 c7-backend java-start-ftb.sh[29279]: 2023.12.10 14:28:40.231 [main] INFO o.s.d.r.c.RepositoryConfigurationDelegate - Finished Spring Data repository scanning in 38 ms. Fou Dec 10 14:28:40 c7-backend java-start-ftb.sh[29279]: 2023.12.10 14:28:40.231 [main] INFO o.s.d.r.c.RepositoryConfigurationDelegate - Finished Spring Data repository scanning in 38 ms. Fou