LAB-07

Integrating Frontend and Backend

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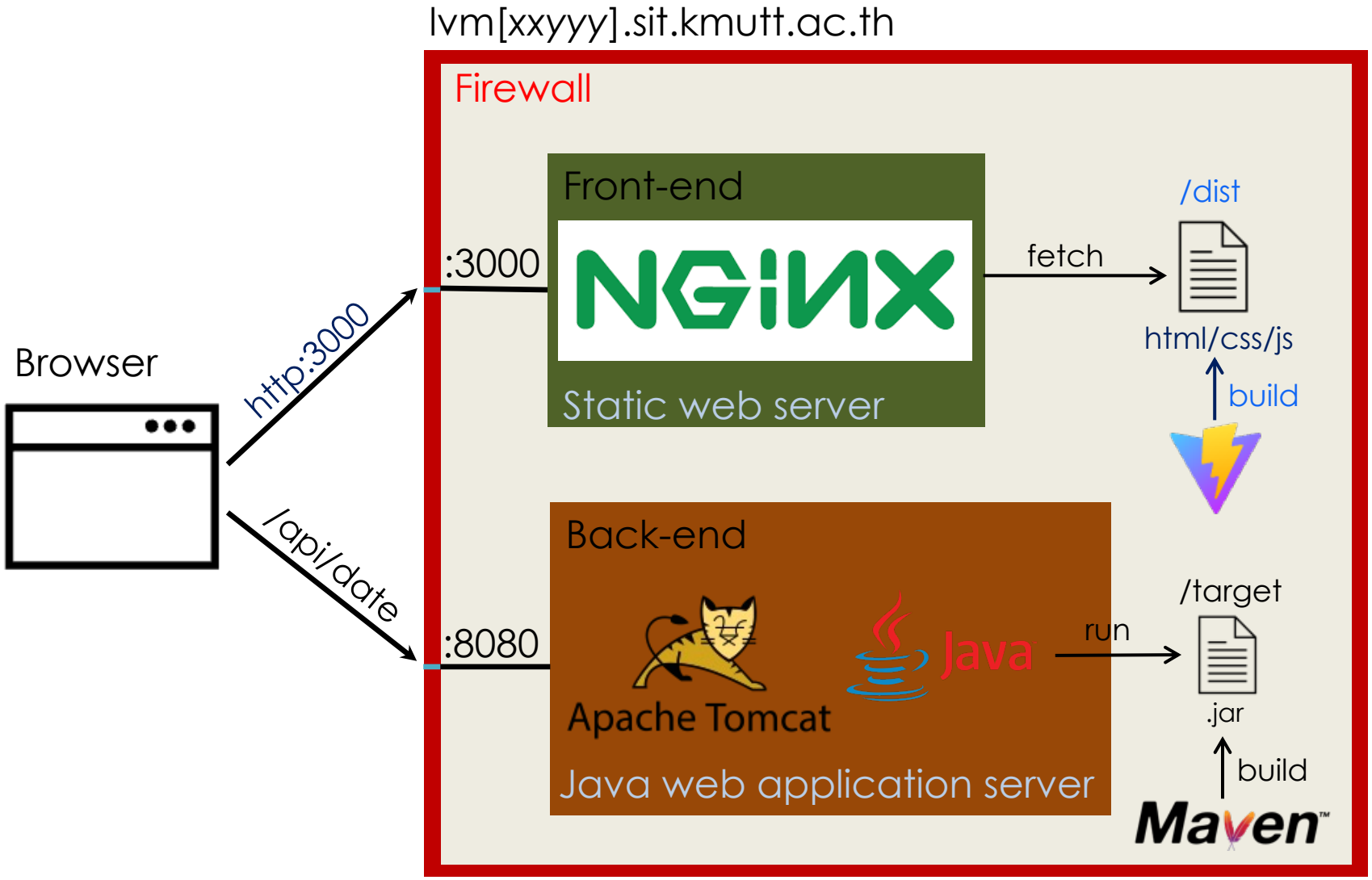
Review Frontend STEPS

1. Install Node.js LTS (v20.x)
2. Create project (`npm create vue@latest`)
3. Install dependencies (`npm install`)
4. Run project in dev mode (`npx vite --host lvm`*`xxxxx`*`.sit.kmutt.ac.th`)
5. Build static web (`npm run build`)
6. Deploy with Nginx
    1. Create nginx conf file in /etc/nginx/sites-available with specified port and root
    2. Create symbolic link to this conf file in /etc/nginx/sites-enabled
    3. Test nginx config (`sudo nginx -t`)
    4. Reload nginx (`sudo nginx -s reload`)
    5. Test with curl
7. Allow specified port on Firewall

Review Backend STEPS

1. Install OpenJDK17 (`sudo apt install -y openjdk-17-jre-headless`)
2. Set JAVA_HOME (`sudo echo JAVA_HOME=/usr/lib/jvm/java-17-openjdk-amd64/ >> /etc/environment`)
3. Create project (`curl -G https://start.spring.io/starter.zip -d dependencies=web -d type=maven-project -o demo.zip`)
4. Allow port 8080/tcp on Firewall
5. Run project with Maven (`./mvnw spring-boot:run`)
6. Build .jar file (`./mvnw clean package`)
7. Run .jar file (`java -jar target/*.jar`)

Architecture



Deploy DateAPI (Backend)

1. Clone DateAPI repository
   (`git clone https://github.com/olarnr/int210-dateapi.git dateapi`)
2. Run project with Maven
3. Test with curl (`curl localhost:8080/api/date`)
4. Build .jar file
5. Run .jar file
6. Test with curl (`curl localhost:8080/api/date`)
7. Test on browser

Deploy fetch-date (Frontend)

1. Clone fetch-date repository
   (`git clone https://github.com/olarnr/int210-fetchdate.git fetchdate`)
2. Modify API_URL to http://lvm65999.sit.kmutt.ac.th:8080/api/date in src/App.vue
3. Install dependencies
4. Run project in dev mode
5. Build static web
6. Deploy with Nginx

Cross-Origin Resource Sharing

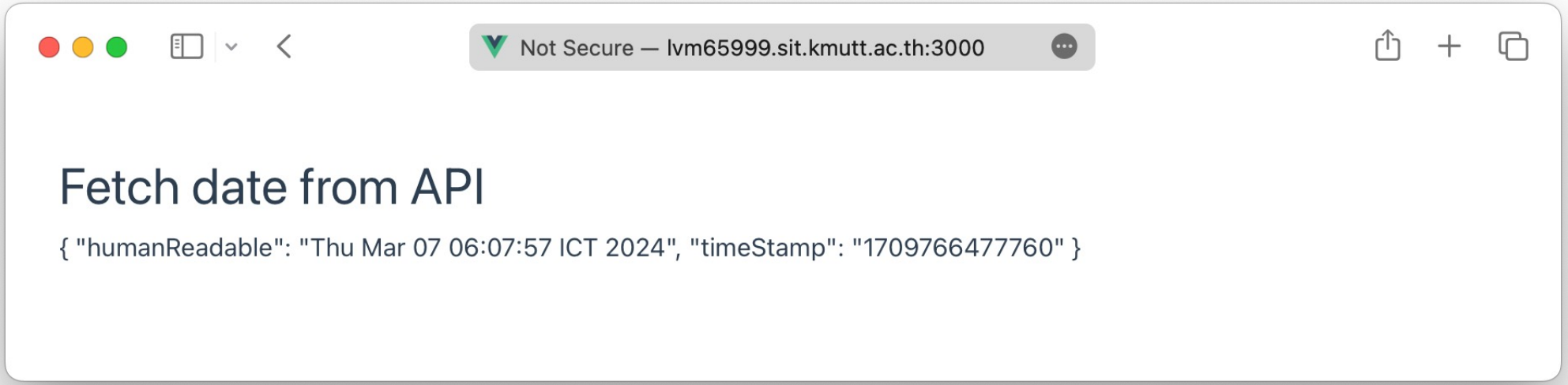

```
package com.example.demo;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.web.bind.annotation.GetMapping;
import org.springframework.web.bind.annotation.RequestParam;
import org.springframework.web.bind.annotation.RestController;

import java.util.Date;
import org.springframework.web.bind.annotation.CrossOrigin;
import org.springframework.web.bind.annotation.ResponseBody;

@SpringBootApplication
@RestController
@CrossOrigin(origins = "http://lvmolarn.sit.kmutt.ac.th:3000")
public class DemoApplication {
    public static void main(String[] args) {
      SpringApplication.run(DemoApplication.class, args);
    }
    @GetMapping("/hello")
    public String hello(@RequestParam(value = "name", defaultValue = "Worl
d") String name) {
<xample/demo/DemoApplication.java" 47L, 1481C           14,62         Top
```

- Modify @CrossOrigin to allow access from your vm port 3000 and 5173

Assignment 4



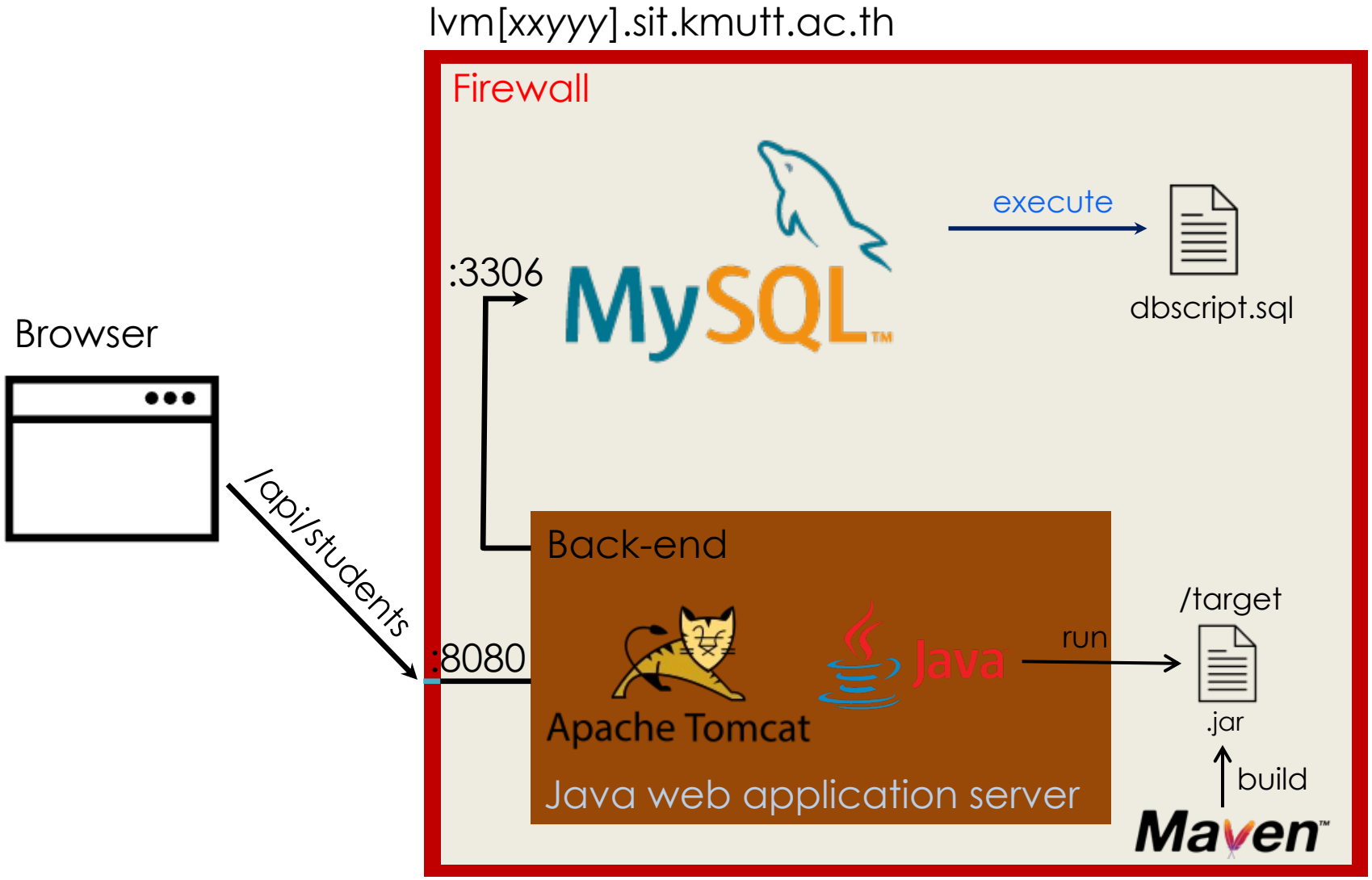
Ensure that Java/Tomcat is running after logout!

LAB-07

Deploy Spring Boot with Mysql

Olarn Rojanapornpun

Architecture



https://github.com/olarnr/int210-studentproj.git

Deploy MySQL - 1

- Install mysql-server and pwgen
- Generate random password using pwgen (`pwgen -sy 10`)
- Alter mysql root user to authenticate using 'mysql_native_password' with the random password.
  Do not forget to record the password securely.
- Secure Mysql installation with 'mysql_secure_installation'
  - Remove anonymous users, Disallow root login remotely, Remove test database and access to it

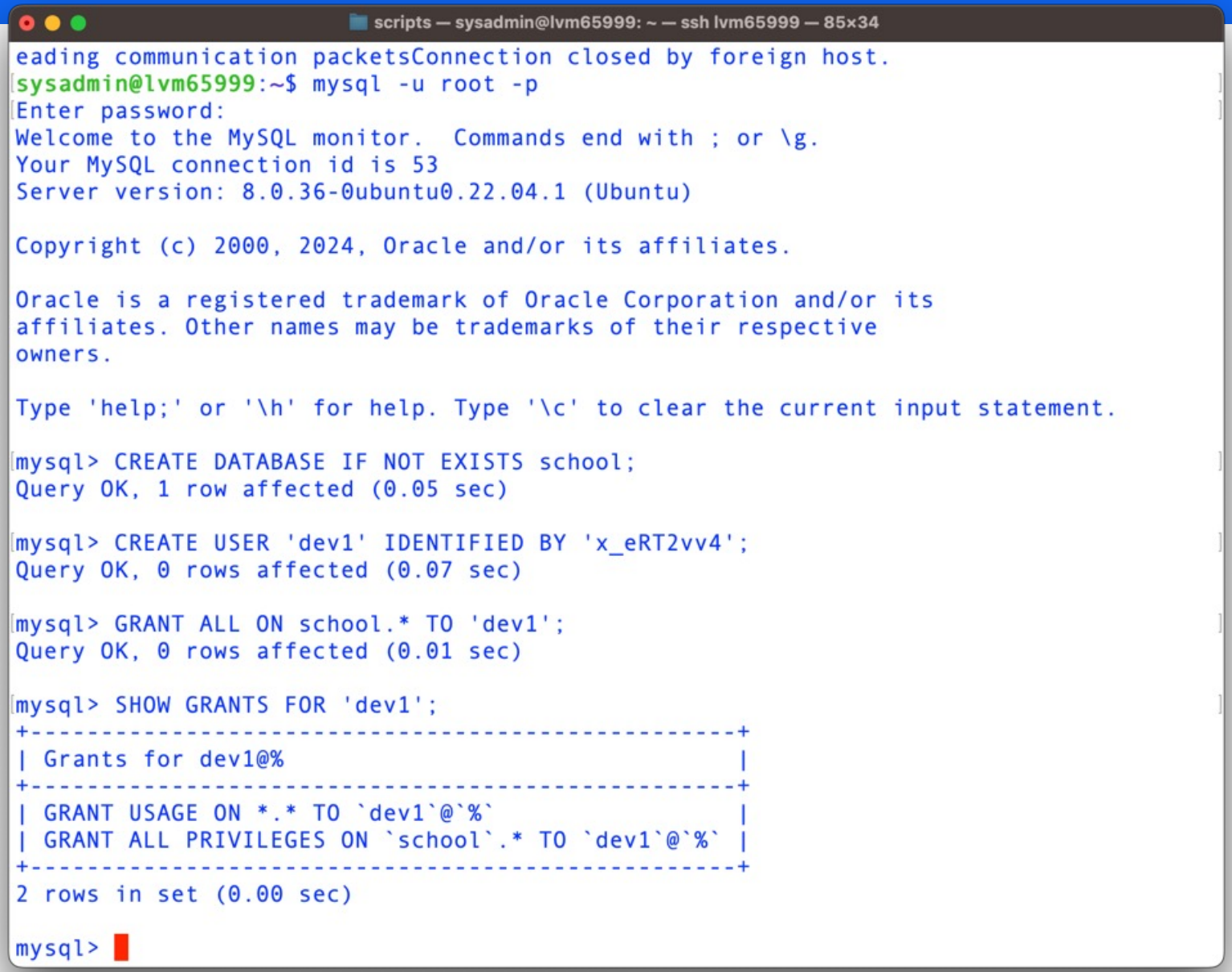
https://www.digitalocean.com/community/tutorials/how-to-install-mysql-on-ubuntu-22-04

Deploy MySQL - 2

- Test the connection with telnet

```
sysadmin@lvm65999:~$ telnet localhost 3306
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
[
8.0.36-0ubuntu0.22.04.14g=C1O:l?qJA t.eBY(k|caching_sha2_password2#08S01Got timeout r
eading communication packetsConnection closed by foreign host.
sysadmin@lvm65999:~$
```

- Create a database '`school`'
- Create '`dev1`' user with the password '`x_eRT2vv4`' and all privileges on '`school`'


scripts — sysadmin@lvm65999: ~ — ssh lvm65999 — 85×34
eading communication packetsConnection closed by foreign host.
sysadmin@lvm65999:~$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 53
Server version: 8.0.36-0ubuntu0.22.04.1 (Ubuntu)
Copyright (c) 2000, 2024, Oracle and/or its affiliates.
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
mysql> CREATE DATABASE IF NOT EXISTS school;
Query OK, 1 row affected (0.05 sec)
mysql> CREATE USER 'dev1' IDENTIFIED BY 'x_eRT2vv4';
Query OK, 0 rows affected (0.07 sec)
mysql> GRANT ALL ON school.* TO 'dev1';
Query OK, 0 rows affected (0.01 sec)
mysql> SHOW GRANTS FOR 'dev1';
+---+
| Grants for dev1@% |
+---+
| GRANT USAGE ON *.* TO `dev1`@`%` |
| GRANT ALL PRIVILEGES ON `school`.* TO `dev1`@`%` |
+---+
2 rows in set (0.00 sec)
mysql>

Deploy MySQL - 3

- Run studentdb/dbscript.sql to create student table

dbscript.sql

```
CREATE DATABASE IF NOT EXISTS school;
USE school;
CREATE TABLE student
   (STDID VARCHAR(11),
   FIRSTNAME VARCHAR(50),
   LASTNAME VARCHAR(50),
   MAJOR CHAR(50),
   CONSTRAINT PKSTUDENT PRIMARY KEY (STDID)
   ) ;
```

- Add data to school.student table using redirection

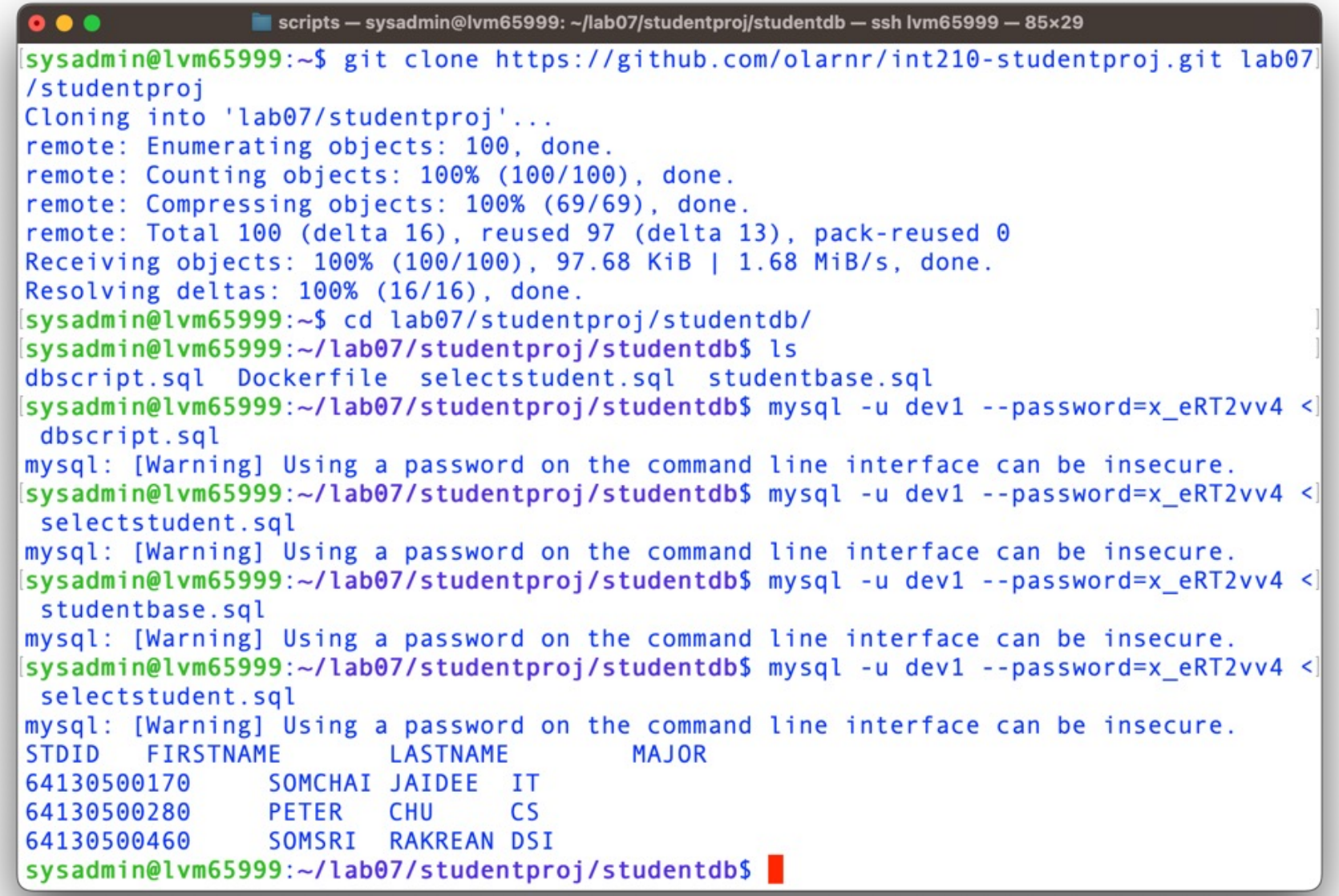
studentdb > studentbase.sql

```
1   USE school;
2   DELETE FROM student;
3
4   INSERT INTO student (STDID,FIRSTNAME,LASTNAME,MAJOR) values ('64130500170','SOMCHAI','JAIDEE','IT');
5   INSERT INTO student (STDID,FIRSTNAME,LASTNAME,MAJOR) values ('64130500280','PETER','CHU', 'CS');
6   INSERT INTO student (STDID,FIRSTNAME,LASTNAME,MAJOR) values ('64130500460','SOMSRI','RAKREAN', 'DSI');
7
```

- View data in school.student table

studentdb > selectstudent.sql

```
1   USE school;
2   SELECT * FROM student;
3
```


scripts — sysadmin@lvm65999: ~/lab07/studentproj/studentdb — ssh lvm65999 — 85×29
sysadmin@lvm65999:~$ git clone https://github.com/olarnr/int210-studentproj.git lab07/studentproj
Cloning into 'lab07/studentproj'...
remote: Enumerating objects: 100, done.
remote: Counting objects: 100% (100/100), done.
remote: Compressing objects: 100% (69/69), done.
remote: Total 100 (delta 16), reused 97 (delta 13), pack-reused 0
Receiving objects: 100% (100/100), 97.68 KiB | 1.68 MiB/s, done.
Resolving deltas: 100% (16/16), done.
sysadmin@lvm65999:~$ cd lab07/studentproj/studentdb/
sysadmin@lvm65999:~/lab07/studentproj/studentdb$ ls
dbscript.sql Dockerfile selectstudent.sql studentbase.sql
sysadmin@lvm65999:~/lab07/studentproj/studentdb$ mysql -u dev1 --password=x_eRT2vv4 < dbscript.sql
mysql: [Warning] Using a password on the command line interface can be insecure.
sysadmin@lvm65999:~/lab07/studentproj/studentdb$ mysql -u dev1 --password=x_eRT2vv4 < selectstudent.sql
mysql: [Warning] Using a password on the command line interface can be insecure.
sysadmin@lvm65999:~/lab07/studentproj/studentdb$ mysql -u dev1 --password=x_eRT2vv4 < studentbase.sql
mysql: [Warning] Using a password on the command line interface can be insecure.
sysadmin@lvm65999:~/lab07/studentproj/studentdb$ mysql -u dev1 --password=x_eRT2vv4 < selectstudent.sql
mysql: [Warning] Using a password on the command line interface can be insecure.
STDID FIRSTNAME LASTNAME MAJOR
64130500170 SOMCHAI JAIDEE IT
64130500280 PETER CHU CS
64130500460 SOMSRI RAKREAN DSI
sysadmin@lvm65999:~/lab07/studentproj/studentdb$

Student API

studentapi > src > main > resources > application.properties

```
spring.datasource.driver-class-name=com.mysql.cj.jdbc.Driver
spring.datasource.username=${mysql_user:dev1}
spring.datasource.password=${mysql_password:x_eRT2vv4}
spring.datasource.url=jdbc:mysql://${mysql_url:dbserver}:3306/school
spring.jpa.hibernate.ddl-auto=none
spring.jpa.hibernate.naming.physical-strategy=org.hibernate.boot.model.
spring.jpa.defer-datasource-initialization=true
spring.jpa.properties.hibernate.jdbc.time_zone=Asia/Bangkok
spring.jackson.time-zone=Asia/Bangkok
server.servlet.encoding.charset=UTF-8
server.servlet.encoding.force-response=true
server.error.include-binding-errors=always
server.error.include-stacktrace=on_param
server.port=${port:8080}
```

Build .jar file

- NB: maven will run test stage << need to be able to connect to db server during build

```
2024-03-07T08:16:06.370+07:00 ERROR 116356 --- [           main] j.LocalContainerEnti
tyManagerFactoryBean : Failed to initialize JPA EntityManagerFactory: Unable to creat
e requested service [org.hibernate.engine.jdbc.env.spi.JdbcEnvironment]

[sysadmin@lvm65999:studentapi$ cat target/surefire-reports/*.txt                    ]
-------------------------------------------------------------------------------
Test set: sit.int210.studentproj.StudentprojApplicationTests
-------------------------------------------------------------------------------
Tests run: 1, Failures: 0, Errors: 1, Skipped: 0, Time elapsed: 5.225 s <<< FAILURE!
- in sit.int210.studentproj.StudentprojApplicationTests
contextLoads  Time elapsed: 0.004 s  <<< ERROR!

Caused by: org.springframework.beans.factory.BeanCreationException: Error creating be
an with name 'entityManagerFactory' defined in class path resource [org/springframewo
rk/boot/autoconfigure/orm/jpa/HibernateJpaConfiguration.class]: Unable to create requ
ested service [org.hibernate.engine.jdbc.env.spi.JdbcEnvironment]
Caused by: org.hibernate.service.spi.ServiceException: Unable to create requested ser
vice [org.hibernate.engine.jdbc.env.spi.JdbcEnvironment]
Caused by: org.hibernate.HibernateException: Unable to determine Dialect without JDBC
 metadata (please set 'javax.persistence.jdbc.url', 'hibernate.connection.url', or 'h
ibernate.dialect')
```

Config /etc/hosts

- We need to ensure that mysql url is accessible from host and mysqld is running
- may config /etc/hosts to add 'dbserver'

```
sysadmin@lvm65999:studentapi$ cat /etc/hosts
127.0.0.1 localhost
127.0.1.1 lvm65999 # lvm65999.sit.kmutt.ac.th
127.0.0.1 dbserver

sysadmin@lvm65999:studentapi$ telnet dbserver 3306
Trying 127.0.0.1...
Connected to dbserver.
Escape character is '^]'.
[
8.0.36-0ubuntu0.22.04.1=N>aYx?S?0Hlc[?-caching_sha2_password2#08S01Got timeout readin
g communication packetsConnection closed by foreign host.
sysadmin@lvm65999:studentapi$
```

Use Environment Variables

- May use mysql_url environment variable (specified in application.properties)

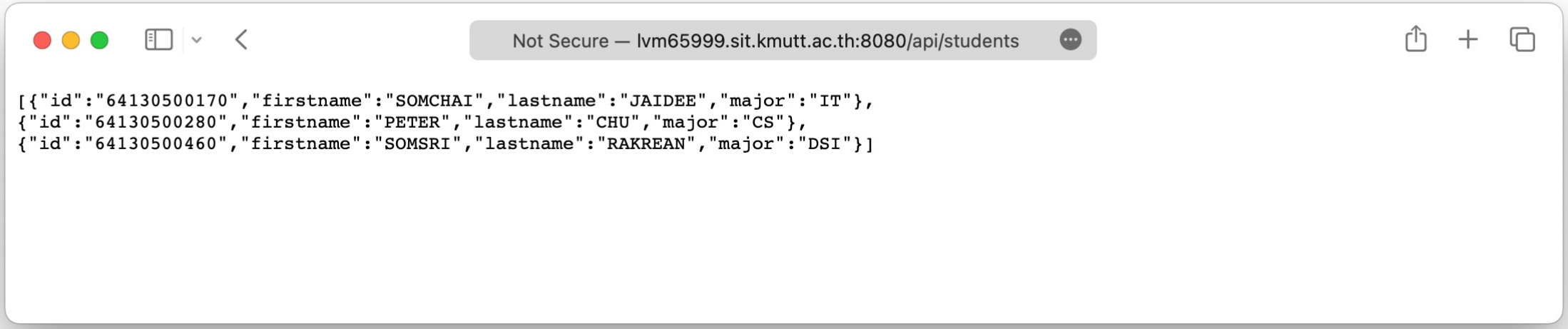
```
sysadmin@lvm65999:studentapi$ export mysql_url=127.0.0.1
sysadmin@lvm65999:studentapi$ echo $mysql_url
127.0.0.1
sysadmin@lvm65999:studentapi$ telnet $mysql_url 3306
Trying 127.0.0.1...
Connected to 127.0.0.1.
Escape character is '^]'.
[
8.0.36-0ubuntu0.22.04.1\V
                                  +Uy?.WJ3Bu%I?caching_sha2_password2#08S01Got timeout
reading communication packetsConnection closed by foreign host.
sysadmin@lvm65999:studentapi$
```

- Must export the variables for Java to use!

Specify environment variable

- May specify the env variable in command line

Call student API


```
sysadmin@lvm65999:studentapi$ curl localhost:8080/api/students
2024-03-07T08:37:43.603+07:00  INFO 116959 --- [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[
localhost].[/]       : Initializing Spring DispatcherServlet 'dispatcherServlet'
2024-03-07T08:37:43.603+07:00  INFO 116959 --- [nio-8080-exec-1] o.s.web.servlet.Disp
atcherServlet        : Initializing Servlet 'dispatcherServlet'
2024-03-07T08:37:43.605+07:00  INFO 116959 --- [nio-8080-exec-1] o.s.web.servlet.Disp
atcherServlet        : Completed initialization in 2 ms
[{"id":"64130500170","firstname":"SOMCHAI","lastname":"JAIDEE","major":"IT"},{"id":"6
4130500280","firstname":"PETER","lastname":"CHU","major":"CS"},{"id":"64130500460","f
irstname":"SOMSRI","lastname":"RAKREAN","major":"DSI"}]sysadmin@lvm65999:studentapi$
```