



# **COMP 6231 Distributed System Design**

Summer 2017

Instructor: Sukhjinder K.Narula

Assignment 2

Chong Li 27813724  
Mengying Ding 40035587

In this assignment, we designed a distributed system by using CORBA. We have three servers(MTL, LVL and DDO) and one Client( ManagerClient ) class. What is different from last assignment is that, this time we use CORBA instead of the language specific RMI.

# Main Points for System Design

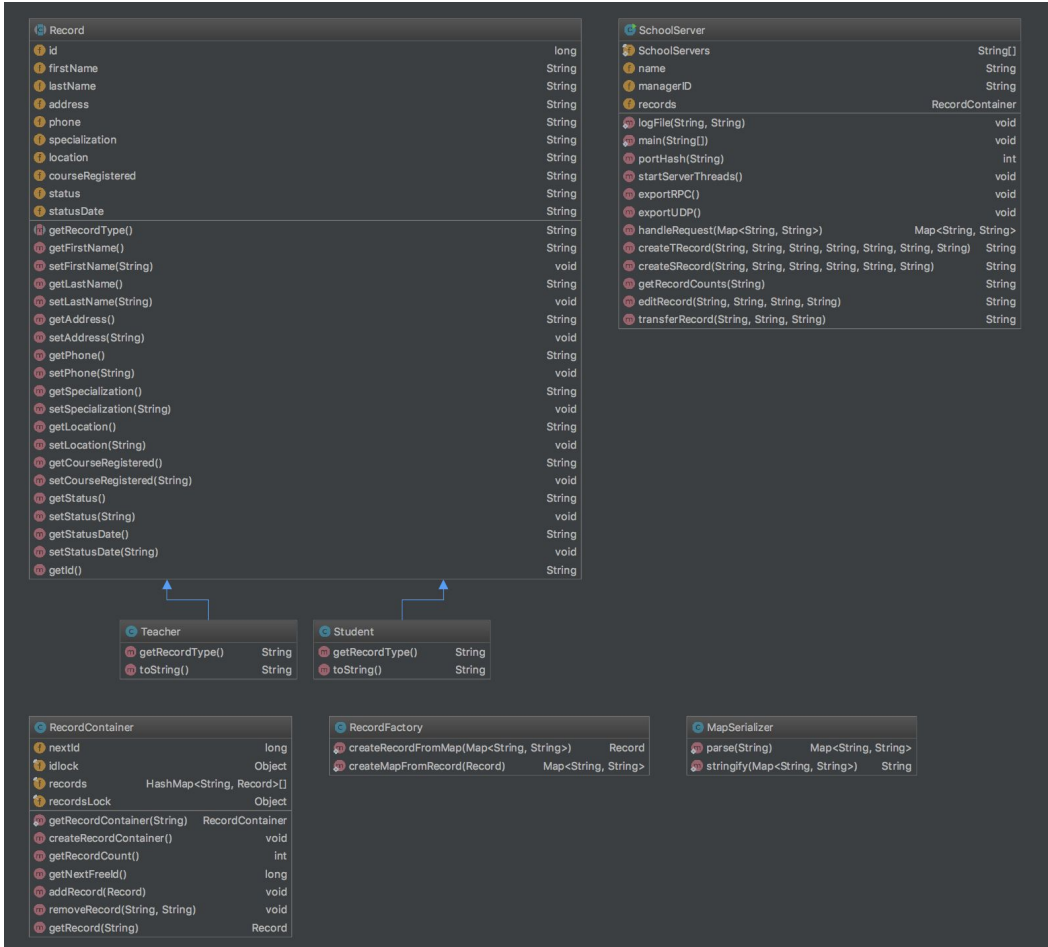
## Data Structures

- We designed Record / Student / Teacher classes to hold record information (please refer to the last part of this section)
- A hashmap to hold records on each server. The key is the first character of the last name, the value is a list stores record ID and other information.

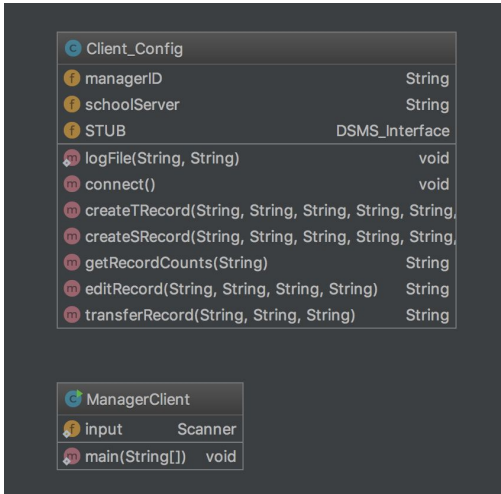
## Request Format

We define the format of requests, which includes 4 digits indicating the type of the operation first, and the rest is the detailed information of the request.

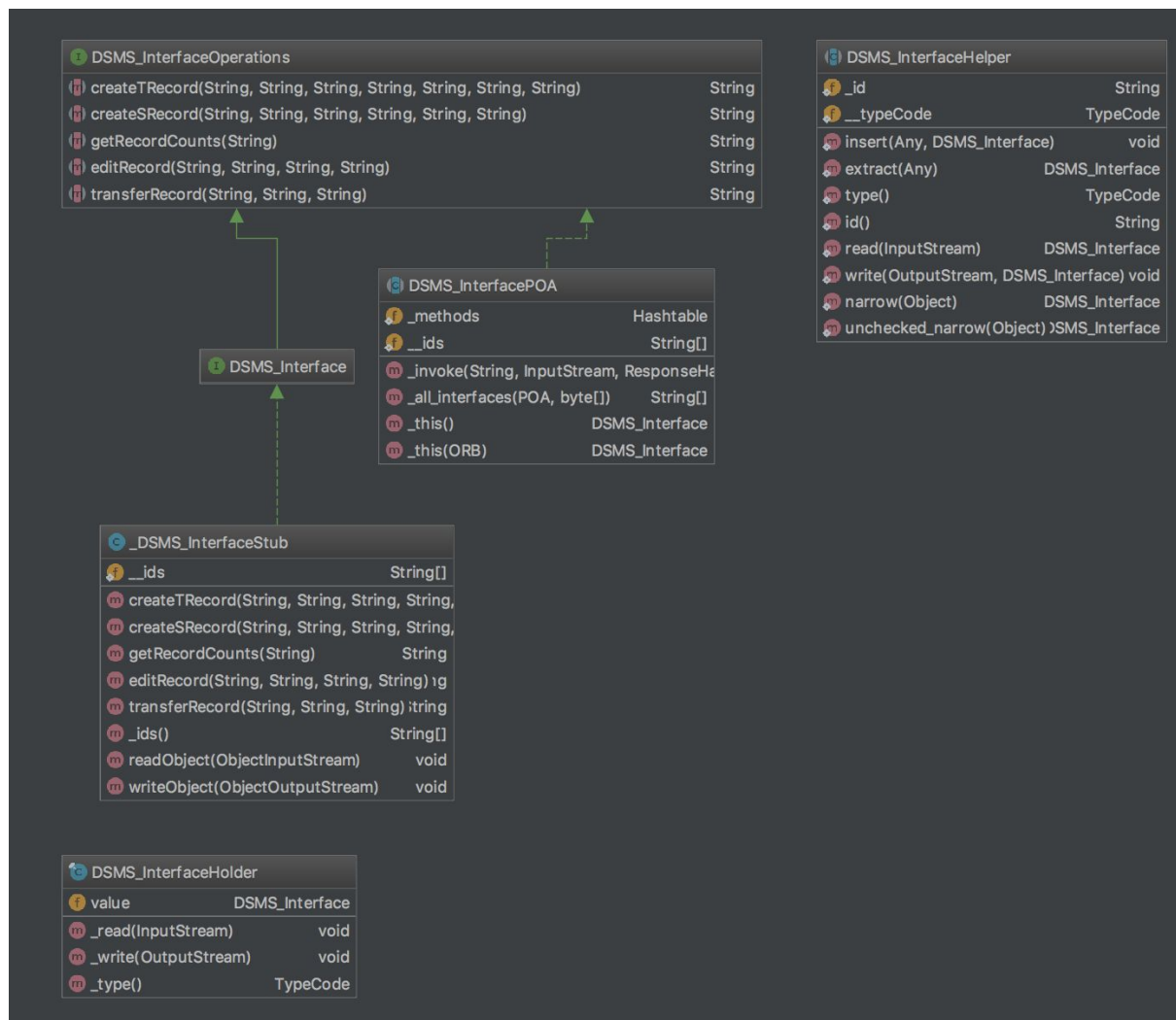
# Server



# Client



# CORBA



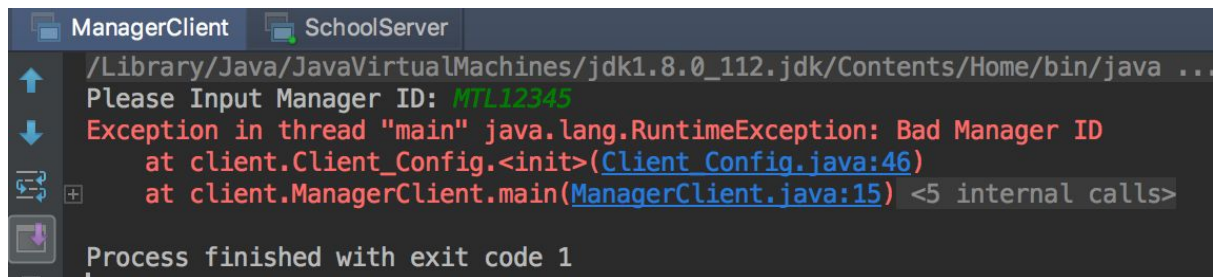
## Multithreading / Synchronization

We synchronize blocks that deal with file I/O, read/write and operations related to the hashmap.

## Test Cases

### Scenario 1.1

Manager enters invalid ID (the ID isn't stored in any of the 3 servers, wrong format included)

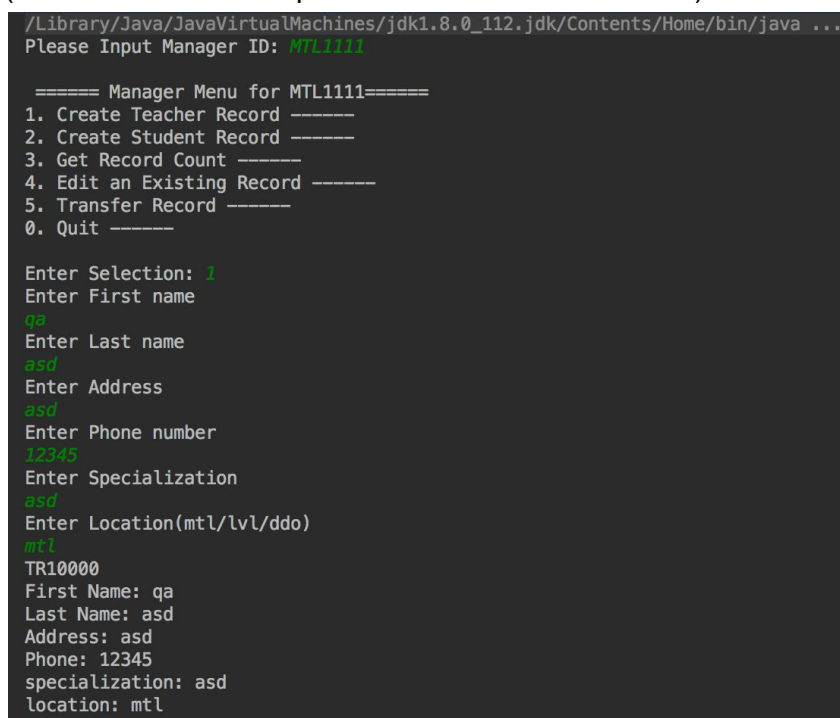


The screenshot shows a Java IDE with two tabs: 'ManagerClient' and 'SchoolServer'. The 'ManagerClient' tab is active, displaying the following code and output:

```
/Library/Java/JavaVirtualMachines/jdk1.8.0_112.jdk/Contents/Home/bin/java ...  
Please Input Manager ID: MTL12345  
Exception in thread "main" java.lang.RuntimeException: Bad Manager ID  
    at client.Client_Config.<init>(Client_Config.java:46)  
    at client.ManagerClient.main(ManagerClient.java:15) <5 internal calls>  
Process finished with exit code 1
```

## Scenario 1.2

A manager(MTL1111) successfully logs in and choose option 1 to create a teacher record (almost the same for option 2 create a student record)



The screenshot shows a Java IDE with two tabs: 'ManagerClient' and 'SchoolServer'. The 'ManagerClient' tab is active, displaying the following code and output:

```
/Library/Java/JavaVirtualMachines/jdk1.8.0_112.jdk/Contents/Home/bin/java ...  
Please Input Manager ID: MTL1111  
  
===== Manager Menu for MTL1111=====  
1. Create Teacher Record -----  
2. Create Student Record -----  
3. Get Record Count -----  
4. Edit an Existing Record -----  
5. Transfer Record -----  
0. Quit -----  
  
Enter Selection: 1  
Enter First name  
qa  
Enter Last name  
asd  
Enter Address  
asd  
Enter Phone number  
12345  
Enter Specialization  
asd  
Enter Location(mtl/lvl/ddo)  
mtl  
TR10000  
First Name: qa  
Last Name: asd  
Address: asd  
Phone: 12345  
specialization: asd  
location: mtl
```

## Scenario 2.1

A manager(MTL1111) chooses option 3 to get counts of records on all 3 servers

```

===== Manager Menu for MTL1111=====
1. Create Teacher Record -----
2. Create Student Record -----
3. Get Record Count -----
4. Edit an Existing Record -----
5. Transfer Record -----
0. Quit -----

Enter Selection: 3
MTL : 1, LVL : 0, DDO : 0,

```

## Scenario 2.2

Using MTL manager(MTL111) to check record count after creating a record on MTL

```

===== Manager Menu for MTL1111=====
1. Create Teacher Record -----
2. Create Student Record -----
3. Get Record Count -----
4. Edit an Existing Record -----
5. Transfer Record -----
0. Quit -----

Enter Selection: 3
MTL : 0, LVL : 1, DDO : 0,

```

## Scenario 3.1

A manager(LVL1111) chooses to edit a student record

```

===== Manager Menu for LVL1111=====
1. Create Teacher Record -----
2. Create Student Record -----
3. Get Record Count -----
4. Edit an Existing Record -----
5. Transfer Record -----
6. Change to another manager -----
0. Quit -----

Enter Selection: 4
Enter RecordID
SR10000
Enter Field Name
status
Enter New Value
not_active
Manger has edit the status of SR10000 to new value: not_active

```

## Scenario 4.1

As a manager(MTL1111), she transfers a record to LVL server

```
===== Manager Menu for MTL1111=====
1. Create Teacher Record -----
2. Create Student Record -----
3. Get Record Count -----
4. Edit an Existing Record -----
5. Transfer Record -----
0. Quit -----

Enter Selection: 5
Enter Record ID:
TR10000
Enter Remote Server:
LVL
TR10000 has been transferred to LVL
```

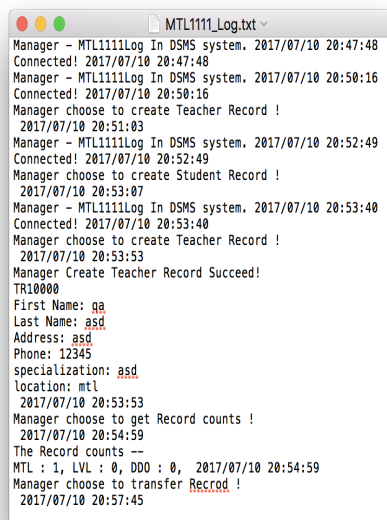
## Scenario 4.2

Manager MTL1111 tries to transfer LVL record to MTL, but failed since it's an invalid operation.

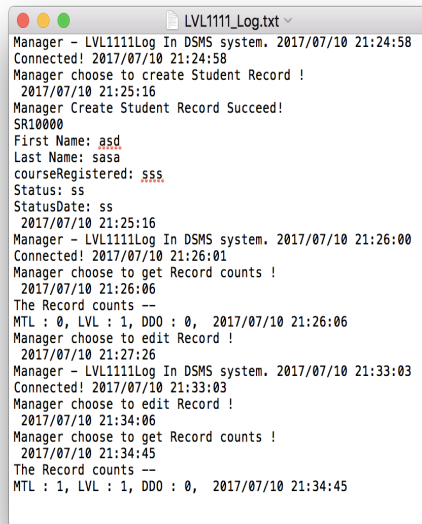
```
===== Manager Menu for MTL1111=====
1. Create Teacher Record -----
2. Create Student Record -----
3. Get Record Count -----
4. Edit an Existing Record -----
5. Transfer Record -----
0. Quit -----

Enter Selection: 5
Enter Record ID:
TR10000
Enter Remote Server:
mtl
_FAIL_
```

## Screenshots for Logs ( related to parts of those scenarios above )



```
Manager - MTL1111Log In DSMS system. 2017/07/10 20:47:48
Connected! 2017/07/10 20:47:48
Manager - MTL1111Log In DSMS system. 2017/07/10 20:50:16
Connected! 2017/07/10 20:50:16
Manager choose to create Teacher Record !
2017/07/10 20:51:03
Manager - MTL1111Log In DSMS system. 2017/07/10 20:52:49
Connected! 2017/07/10 20:52:49
Manager choose to create Student Record !
2017/07/10 20:53:07
Manager - MTL1111Log In DSMS system. 2017/07/10 20:53:40
Connected! 2017/07/10 20:53:40
Manager choose to create Teacher Record !
2017/07/10 20:53:53
Manager Create Teacher Record Succeed!
TR10000
First Name: qa
Last Name: asd
Address: asd
Phone: 12345
specialization: asd
location: mtl
2017/07/10 20:53:53
Manager choose to get Record counts !
2017/07/10 20:54:59
The Record counts --
MTL : 1, LVL : 0, DDO : 0, 2017/07/10 20:54:59
Manager choose to transfer Recrod !
2017/07/10 20:57:45
```



```
Manager - LVL1111Log In DSMS system. 2017/07/10 21:24:58
Connected! 2017/07/10 21:24:58
Manager choose to create Student Record !
2017/07/10 21:25:16
Manager Create Student Record Succeed!
SR10000
First Name: asd
Last Name: sasa
courseRegistered: sss
Status: ss
StatusDate: ss
2017/07/10 21:25:16
Manager - LVL1111Log In DSMS system. 2017/07/10 21:26:00
Connected! 2017/07/10 21:26:01
Manager choose to get Record counts !
2017/07/10 21:26:06
The Record counts --
MTL : 0, LVL : 1, DDO : 0, 2017/07/10 21:26:06
Manager choose to edit Record !
2017/07/10 21:27:26
Manager - LVL1111Log In DSMS system. 2017/07/10 21:33:03
Connected! 2017/07/10 21:33:03
Manager choose to edit Record !
2017/07/10 21:34:06
Manager choose to get Record counts !
2017/07/10 21:34:45
The Record counts --
MTL : 1, LVL : 1, DDO : 0, 2017/07/10 21:34:45
```

## The Most Import Problems We Met

- CORBA standard is more complex than RMI, it costs time to understand the functions of each generated .java file and know how to use them.
- Although we have the tutorial of setting up CORBA, we spent a lot of time to make sure that it is runnable on our own machine.
- CORBA is extremely old-fashioned. When there are problems, sometimes we cannot get accurate solutions.

## Conclusion

- Start the project as soon as possible.
- CORBA is too old, nobody is gonna use it.