Introduction to Benchmark

Database Systems
DataLab, CS, NTHU
Spring, 2019

Outline

- VanillaBench Project
    - Introduction to VanillaBench
    - Starting Up Server for Benchmarking
    - Setting Benchmark Configurations
    - Running Benchmark Client

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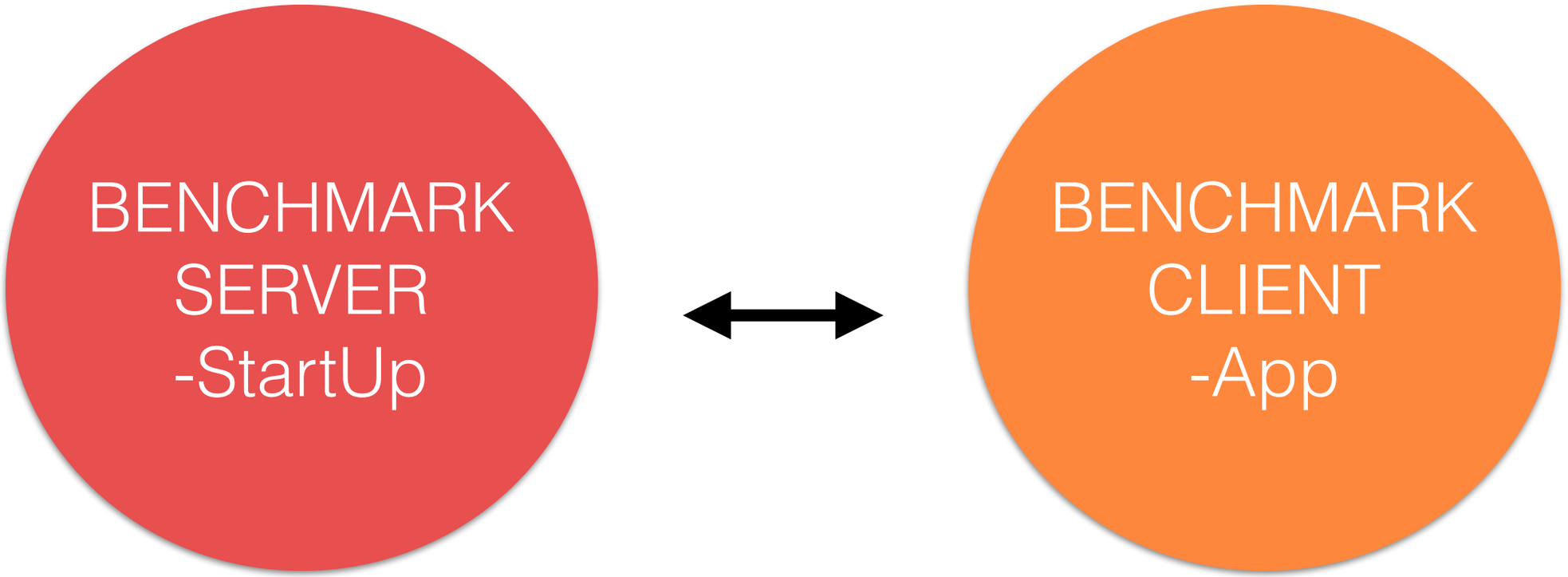
VanillaBench

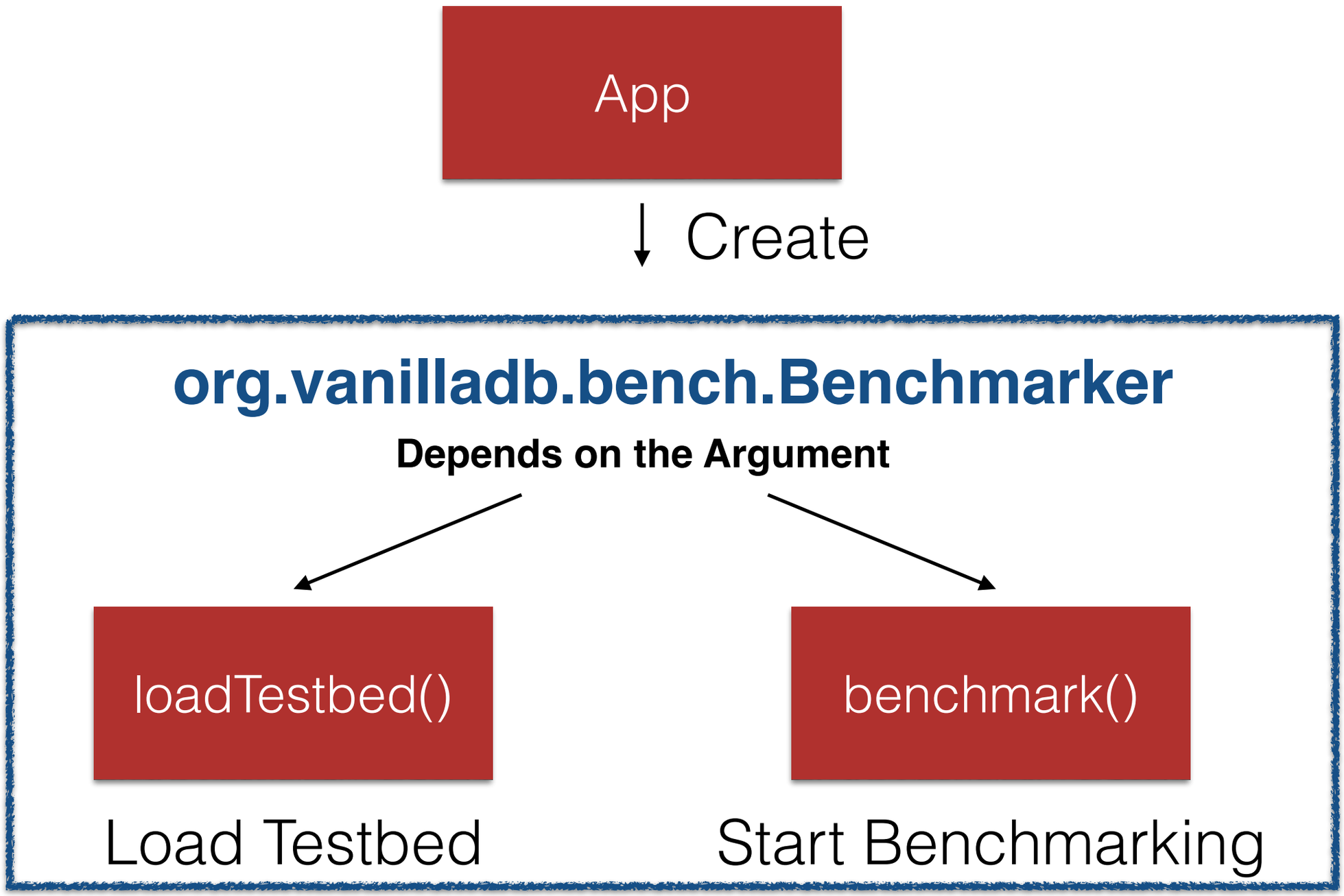
- VanillaBench is a project designed for automatically benchmarking VanillaCore
- It contains several benchmark procedures
- It also has a lot of adjustable testing parameters

[Icon Source]

Two Main Methods



The Workflow of A Client



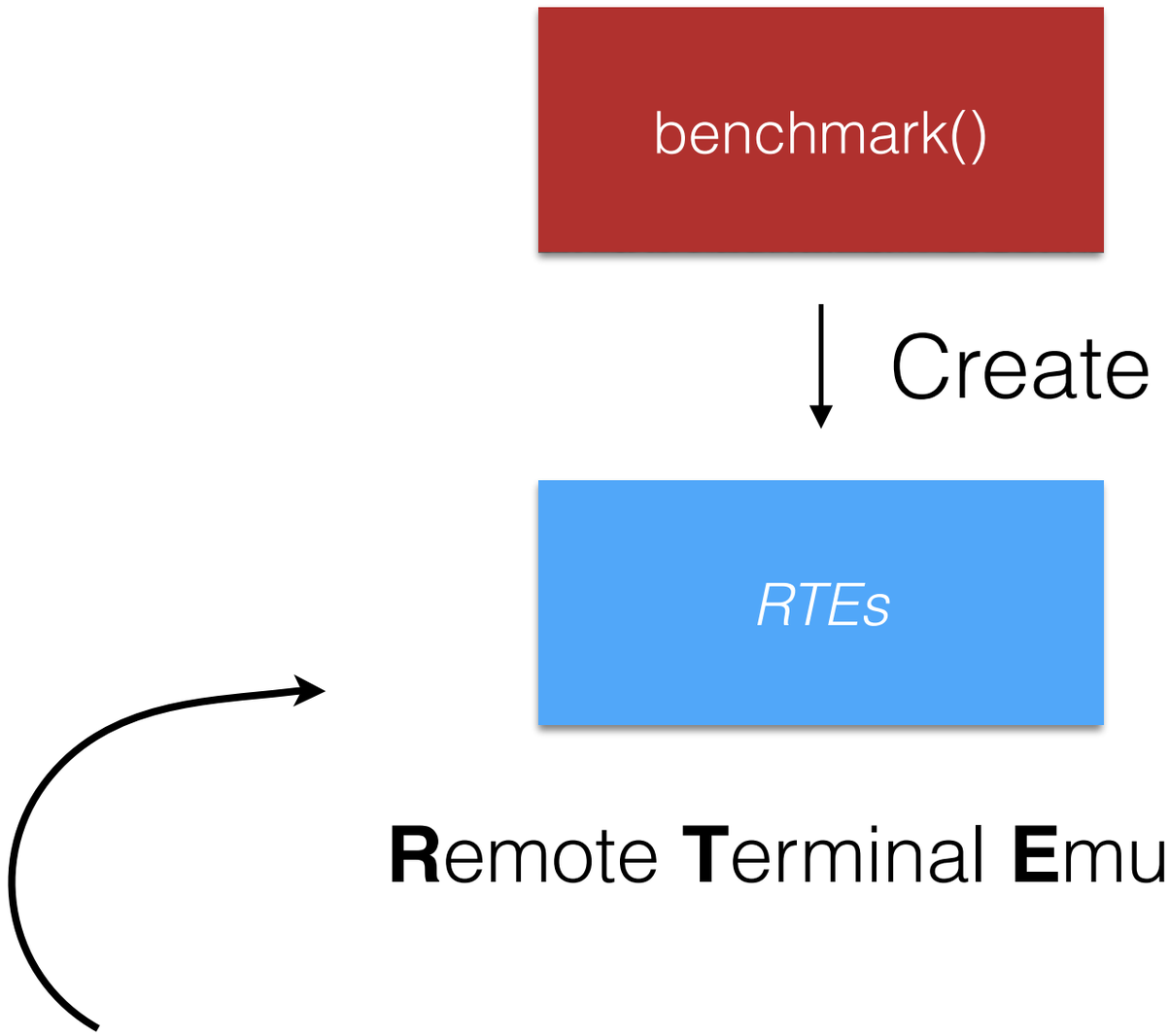
Loading Testbed

loadTestbed()

Connect to server and execute:

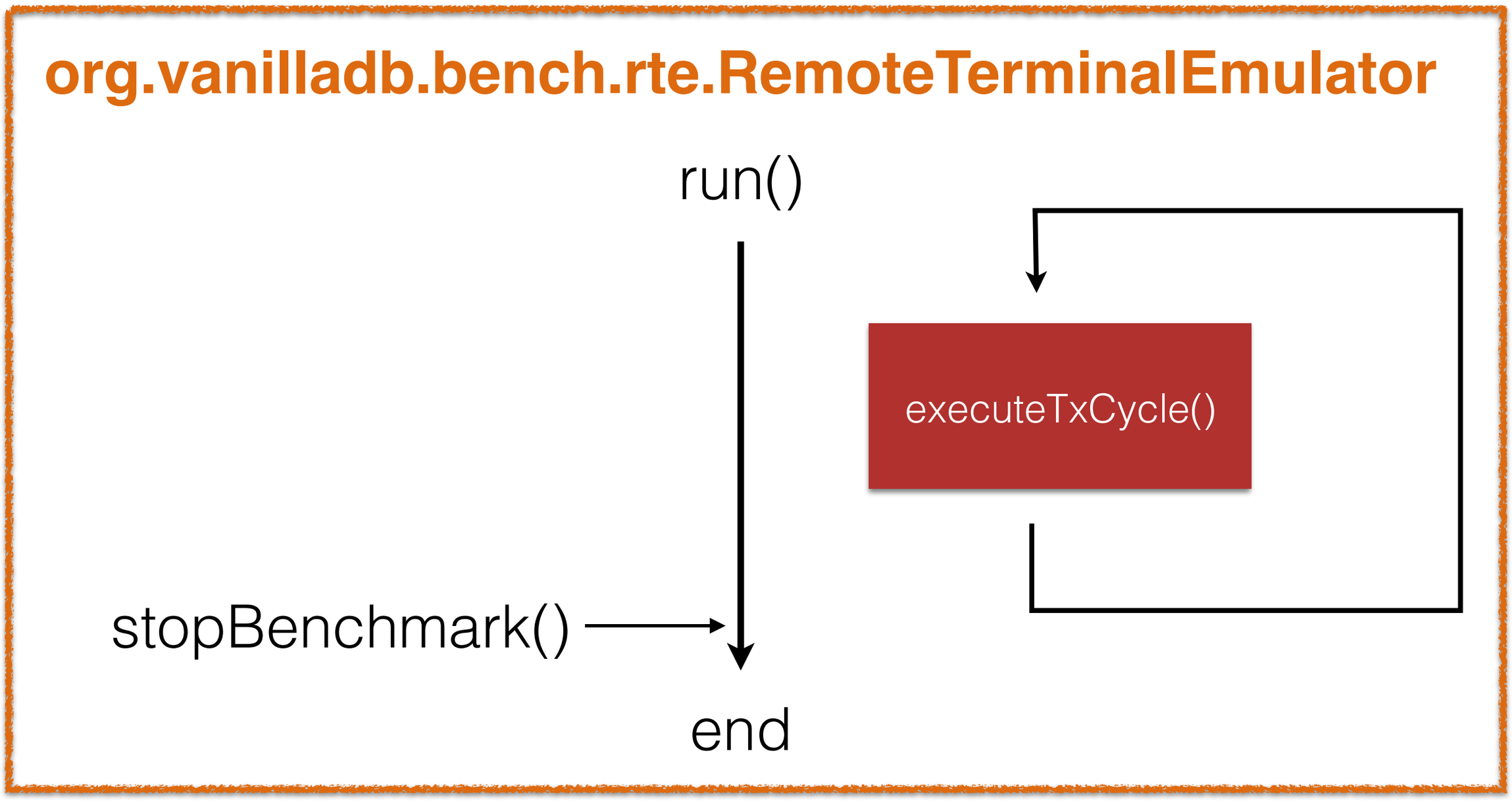
TestbedLoader

Starting Benchmark

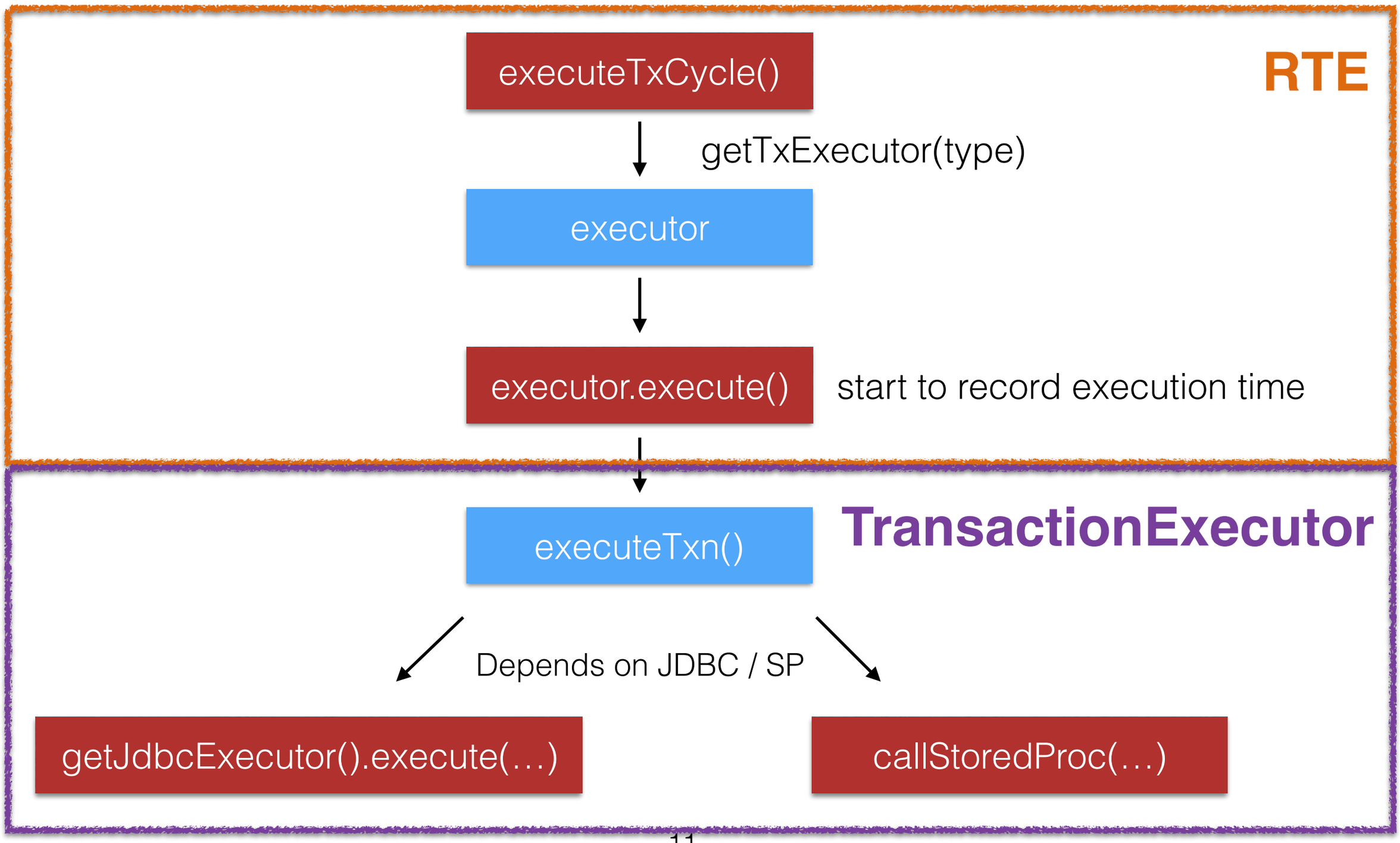


Server & Client

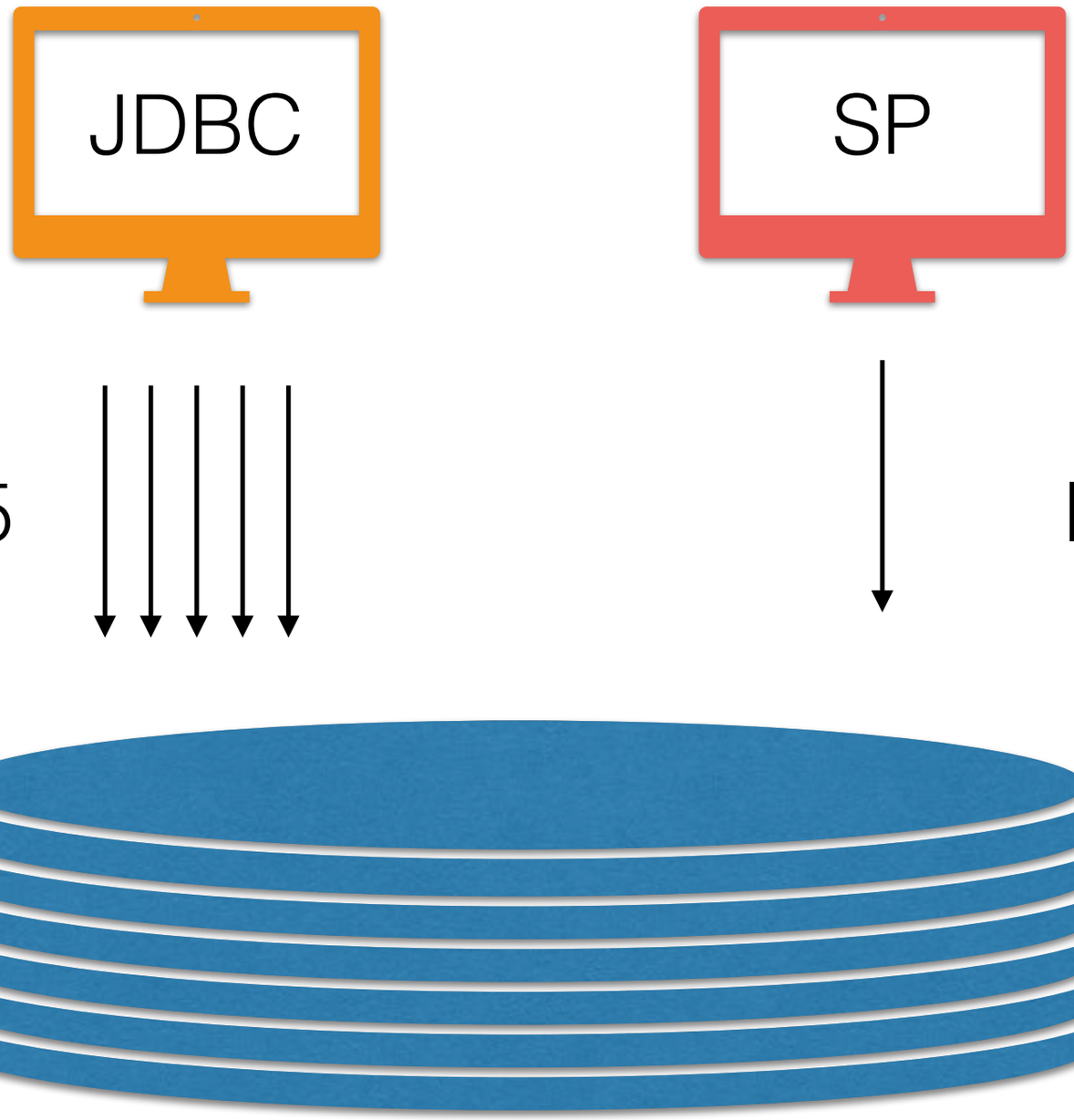
RTE's Life Cycle



Executing a Tx



JDBC / SP ?



Workflow of Executing a Tx

- General steps
    - Generate parameters from TxParamGenerator
- Store Procedure
    - **callStoredProc(…)** to execute a stored procedure on the **remote server**, with the generated parameters
    - Remote server will return a **SutResultSet** when the procedure is finished
- JDBC
    - **getJdbcExecutor().execute(…)** to execute a JDBC Job in the **local**, with the generated parameters
    - Job will executing each sql via JDBC connector

How Server Process a StoredProc call ?

- When the server receive a remote procedure call, it will ask StoredProcFactory to generate the appropriate StoredProcedure
- The server will then call the StoredProcedure methods:
  - prepare(Obj…)
    - preparing the parameters
  - execute()
    - executing the transaction
    - this method will return the final result to the client

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Pull the Project First

- The code of VanillaBench has been pushed to vanilladb repository

- All you need is to pull from the remote repository

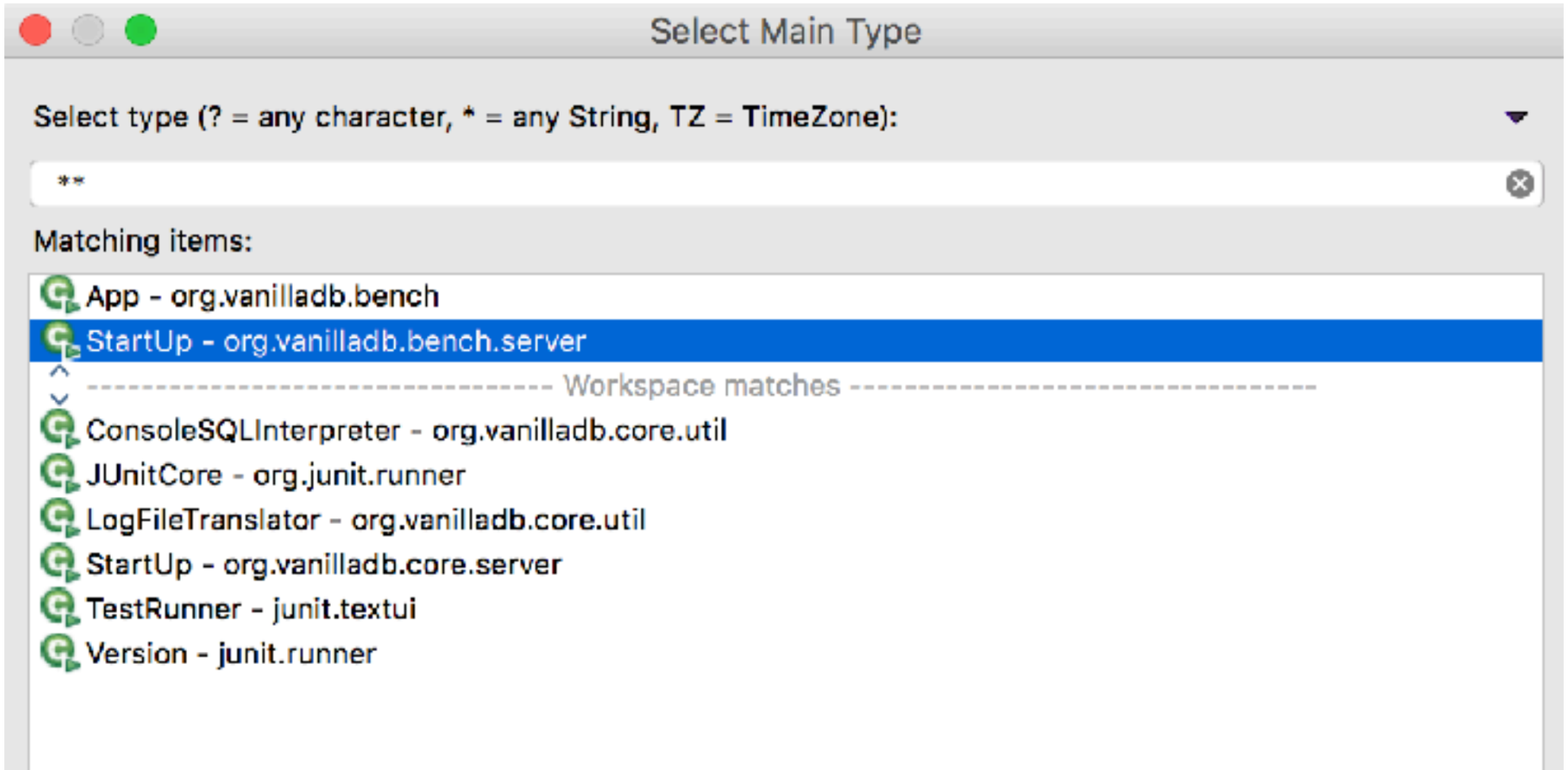
```
> git pull
```

- If you had deleted the project, clone from here:

  - https://shwu10.cs.nthu.edu.tw/courses/databases/2019-spring/vanilladb

Starting Up Server (1/2)

- To benchmark a VanillaDB server, you need to start up the server in another entry point

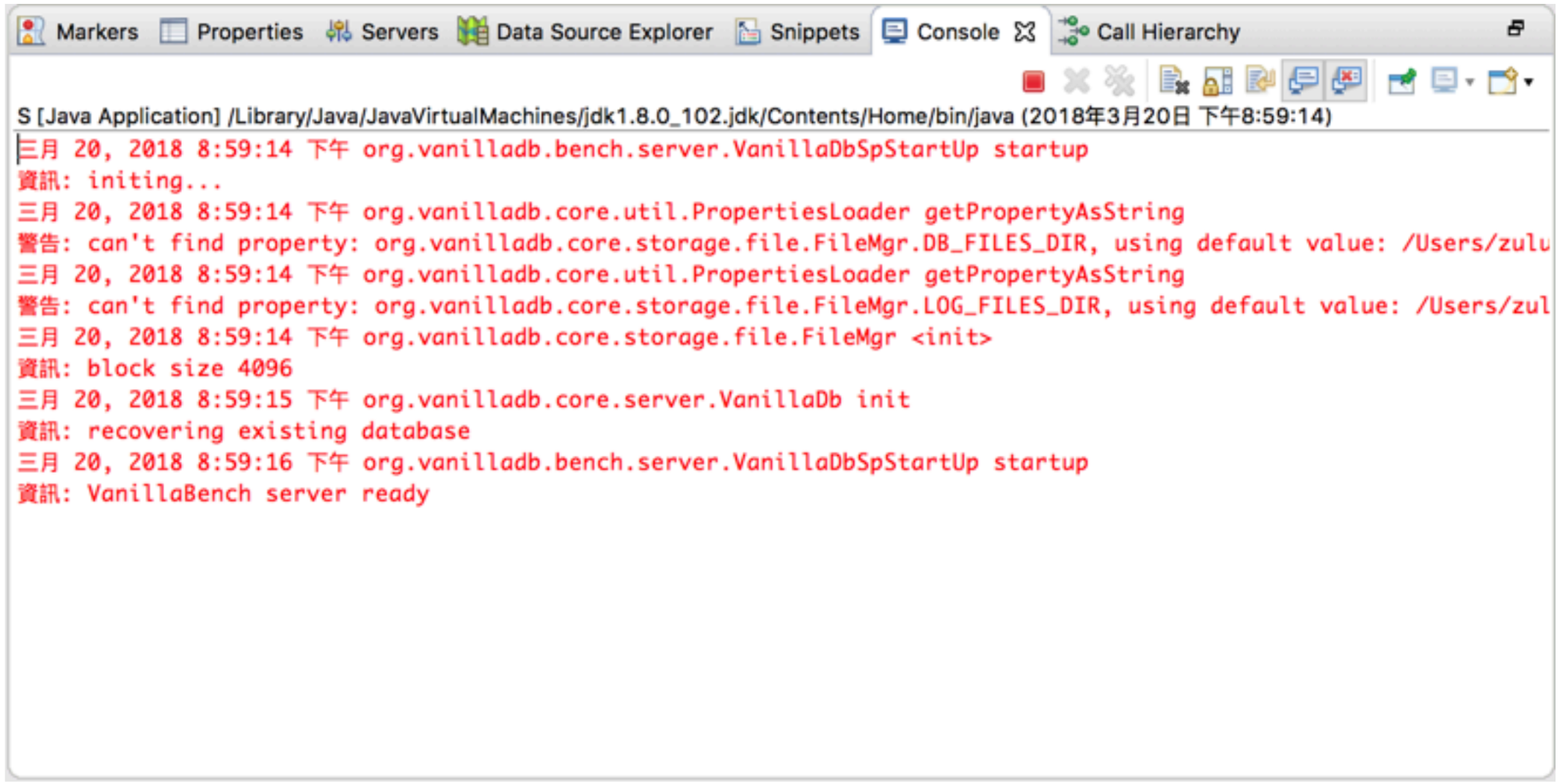


Starting Up Server (2/2)

- You also need to add one more VM argument for benchmarking.
- Don’t forget to add the Database Directory Name

You can copy those arguments from here

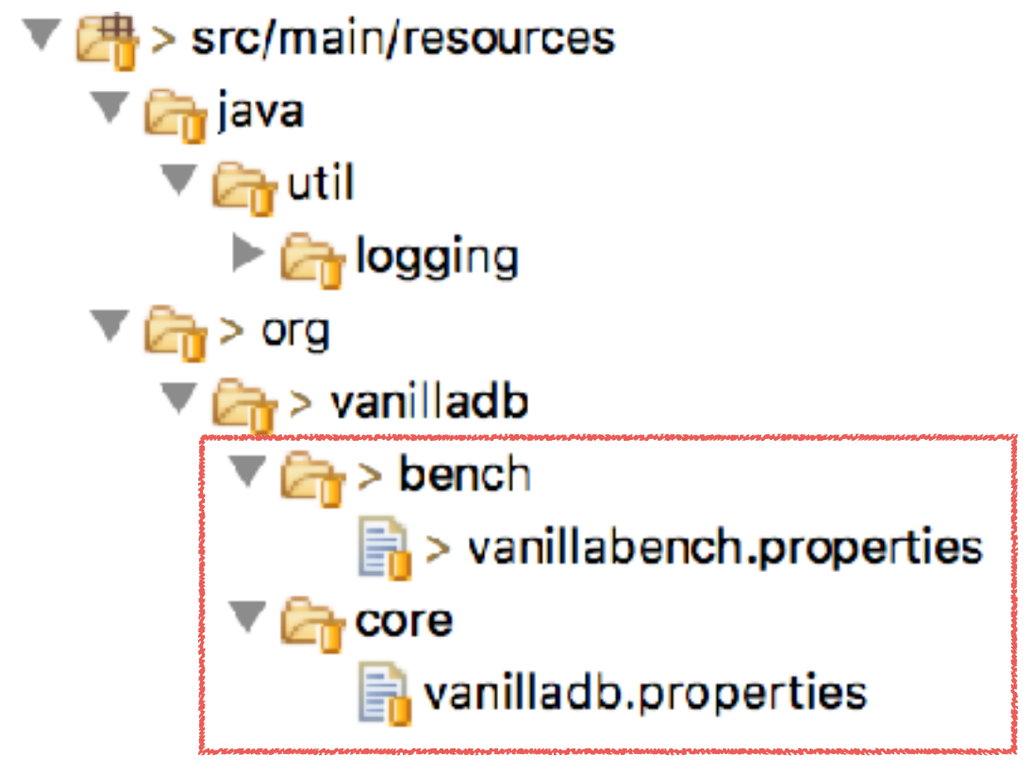
Server Messages



You should see similar messages
if there is nothing wrong.

Setting Benchmark

- Benchmark project also has its own set of properties files



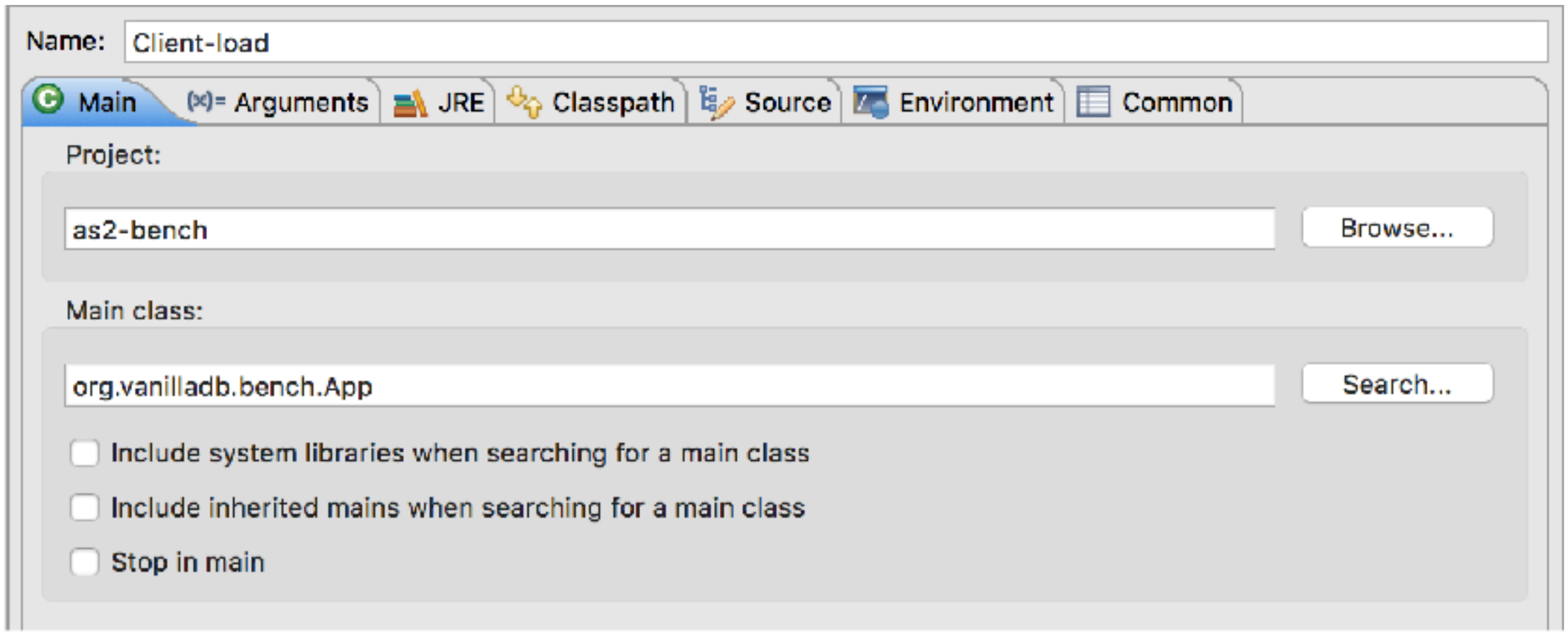
```
1
2 #
3 # Basic Parameters
4 #
5
6 # The running time for warming up before benchmarking
7 org.vanilladb.bench.BenchmarkerParameters.WARM_UP_INTERVAL=3000
8 # The running time for benchmarking
9 org.vanilladb.bench.BenchmarkerParameters.BENCHMARK_INTERVAL=6000
10 # The number of remote terminal executors for benchmarking
11 org.vanilladb.bench.BenchmarkerParameters.NUM_RTES=10
12 # The IP of the target database server
13 org.vanilladb.bench.BenchmarkerParameters.SERVER_IP=127.0.0.1
14 # 1 = JDBC, 2 = Stored Procedures
15 org.vanilladb.bench.BenchmarkerParameters.CONNECTION_MODE=2
16 # The path to the generated reports
17 org.vanilladb.bench.StatisticMgr.OUTPUT_DIR=
18 # Whether the RTEs display the results of each transaction
19 org.vanilladb.bench.rte.TransactionExecutor.DISPLAY_RESULT=false
20 # The number of items in the testing data set
21 org.vanilladb.bench.as2.As2Constants.NUM_ITEMS=100000
```

Important Parameters

- CONNECTION_MODE
  - It means whether it should use JDBC or stored procedures

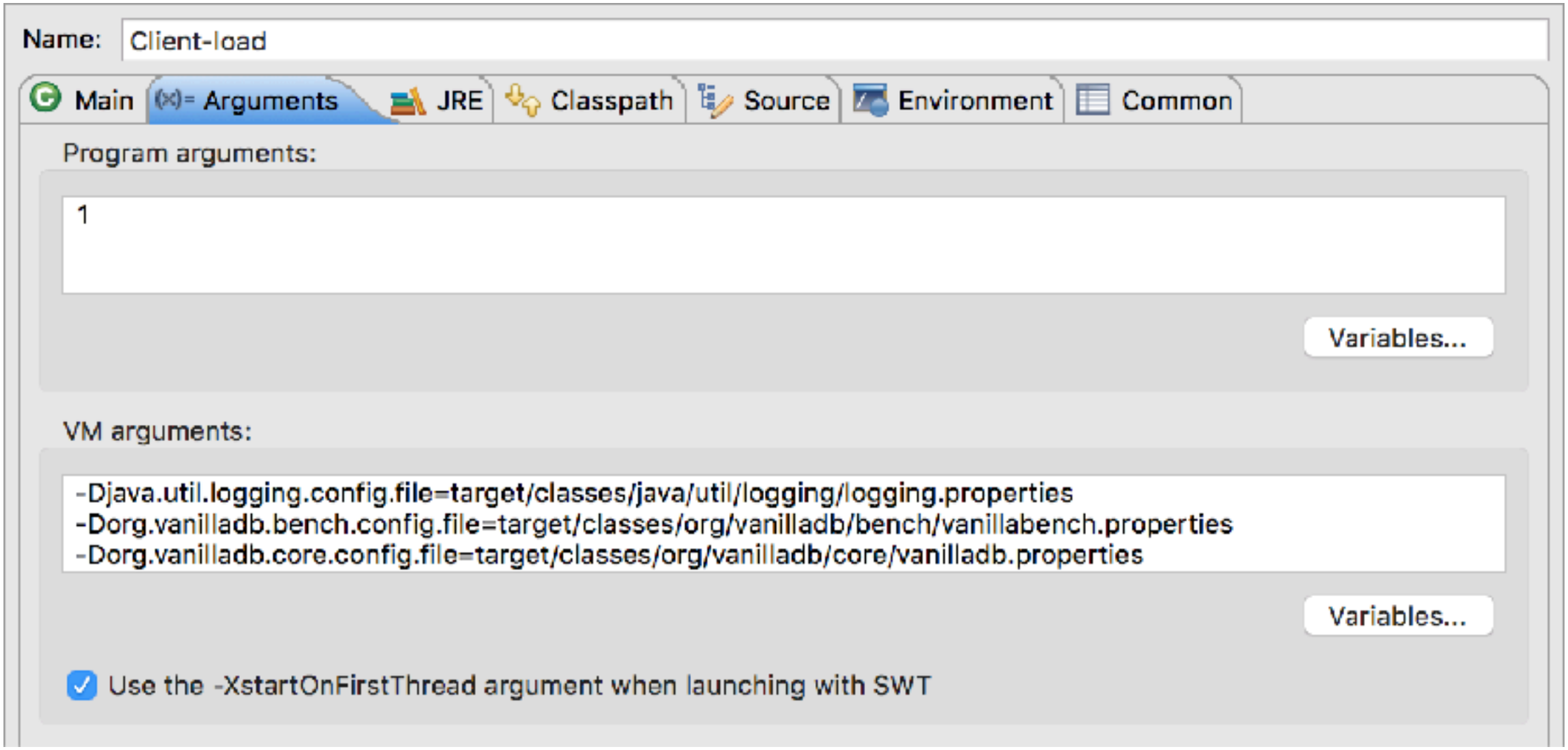
Running Client

- To run clients, create a run configuration for it



Arguments

- We also need to set some arguments
- Program Arguments
    - [Action]
    - 1 : Load Test-Bed
    - 2 : Lunch Benchmark
- VM Arguments
    - Use the same as the server



You can copy those arguments from here, then click ‘Apply’ and ‘Run’

Notes

- Before running testing, please **load testbed** first
- Check if the output directory path that show in properties file exists
  - If not, create one or change the path

Run VanillaDB in Command Line

- Export client and server in .jar format
- Copy three property files into the folder where you export .jar file
- Type in the command as follow:

```
java { VM Arguments } -jar { server/client }.jar  { Program Arguments }
```

Q&A

- If you got any problem, you could check here first
  - https://shwu10.cs.nthu.edu.tw/courses/databases/2019-spring/faq

- If your problem was very unique, just send us an email