

CS425 MP1

In this project, unicast, causal order multicast and total order multicast process.
(check README.md for better format)

Basic schema

- Each process is a java process
- Each process has one thread to handle user Input, one thread to send message, and one thread for receiving message from its peers.
- There is a master node to handle total order multicast.
- Each process maintain an internal vector clock

Requirement

- MacOS or Linux (gnome desktop preferred)
- Java 9 installed
- Gradle installed

Project structure

```
.
  BlockingProcess.java           # Unicast process
  CausalMulticastDemo.java       # Causal order multicast startup
  CausalOrderProcess.java       # Causal order multicast processs
  Config.java                   # Configuration file parser
  DelayParser.java              # Delay parser for causal order "dealy command"
  DeliverThread.java            # The thread for deliver
  Master.java                   # Master process for total order multicast
  MasterUp.java                 # Master process startup
  Message.java                  # Message object for total order multicast
  Packet.java                   # Packet object for causal order multicast
  TotalOrderDemo.java           # "Ordinary" total order multicast startup
  TotalOrderProcess.java        # "Ordinary" total order multicast process
  UnicastDemo.java              # Unicast startup
  VectorClock.java              # Vecterclock object
```

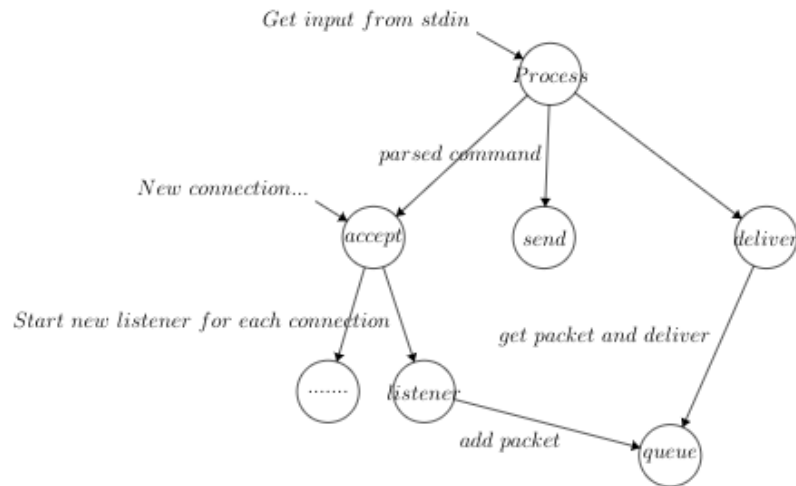


Figure 1:

Overview of a process

Build

`gradle jar` *#(at root dir)*

Run

- Run CausalMulticastDemo by `.jar` after build
`java -cp build/libs/CS425MP1.jar Process.CausalMulticastDemo <id> CausalConfiguration [script]`
- Run TotalOrderDemo by `.jar` after build
`java -cp build/libs/CS425MP1.jar Process.TotalOrderDemo <id> TotalConfiguration [script]`
- Run UnicastDemo by `.jar` after build
`java -cp build/libs/CS425MP1.jar Process.UnicastDemo <id> UnicastConfiguration [script]`
- Startup 4 Unicast processes
`./UnicastRun.sh 4`
 #the number of process, has to be consistent to configuration file
- Startup 4 Total order multicast processes

```
./TotalMulticastRun.sh 4 [script directory name]  
#the number of process, has to be consistent to configuration file  
#read startup command from script directory
```

- Startup 4 Causal order multicast processes

```
./CausalMulticastRun.sh 4 [script directory name]  
#the number of process, has to be consistent to configuration file  
#read startup command from script directory
```

Available command

Unicast

```
send <id: int> <message>
```

Total multicast

```
msend <message> [delay]
```

(The delay parameter is optional, if you want to customize the delay you can add the delay, otherwise there will be a randomized delay within the range specified in the configuration file)

Causal multicast

```
sleep (sleep for 1000ms)
```

```
clock (check current vector clock)
```

```
msend <message> [delay id=delay,id=delay...]
```

(the last delay will be used to other unspecified processes, current thread is always 0 (I think If not specified delay explicitly, random delay will be used)

Exit

Just press Ctrl+C

Script format

Same as available command