DSJDB : Distributed System Java Debugger

We have implemented a simple Distributed Java Debugger, according to a paper dealing with implementing a distributed Debugger with GDB. This work may seem straight forward but it is not the case. In order to debug a system we have to know:

-What does happen?

-When does it happen?

-Where (On Which computer) does it happen?

Actually we have to deal with several problems in order to build this system. Here is the biggest we had to face:

-Interacting with the JDB: JDB cannot send data directly through a Network. Thus we have to implement some sort of interface between JDB and the network. We have used two Java class. RunComand, enables us to launch a process from a java file, and the class process enables us to retrieve the Output Stream, Error Stream and Input Stream of a process. We have to handle this stream in three different threads, in order to not block one of them. For example if we wait for data, in the InputStream, we cannot receive data from the Outputstream, and thus we have a deadlock. Then, theses three different threads must “timestamp” the data. (We will talk about it later).Once the data time, the data, go through a socket to the master, are reordered and displayed.

-Non-real time network: The Network is not a real time network. It means, that if the link between Client 1 and Master is much slower than the link between Client2 and Master, some data generated before, by the Client1 could arrive after the data generated by Client2. Thus the data received by the master would be displayed in the wrong order. So we have to “timestamp” the data on every client in order to know which have been generated before the other. This is based on the assumption that every computer is time synchronized. From that, we can understand that the computer time, synchronization, is very important in a distributed system. Then once the data received by the master, they need to be reordered according to a timestamp by a separate thread and then transferred to the master GUI.

All theses information can be summarize in 3 simple diagrams: