Two Phase Commit Simulator: User Guide

Running/Compiling

To start the program, simply open a terminal in this directory (`TwoPhaseCommit`) and use

```
java -jar TwoPhaseCommit.jar
```

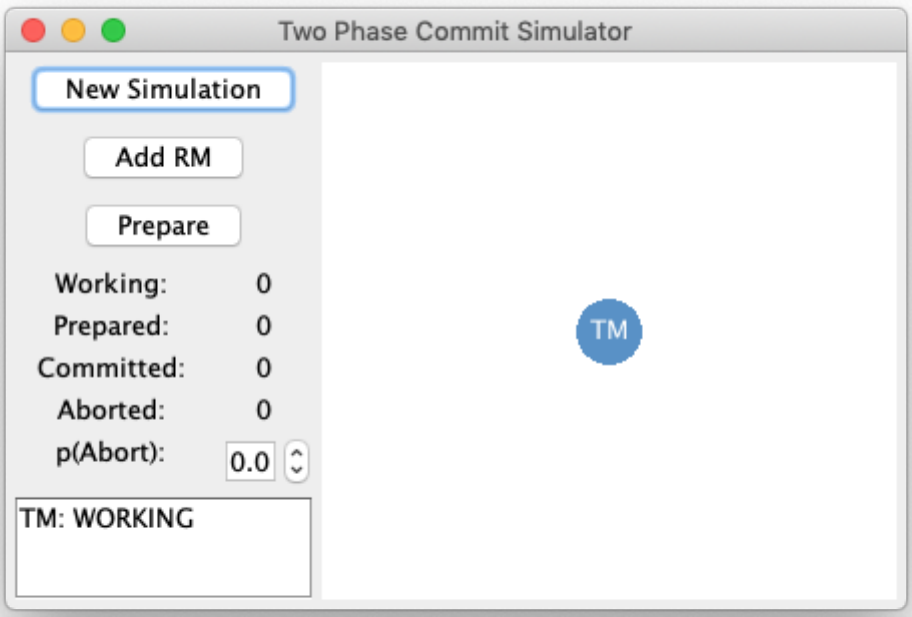
Also, one can recompile the project on one's own machine using Apache Ant by simply running

```
ant
```

in the `TwoPhaseCommit` directory.

The program was built using the Eclipse IDE, so a third option is to open the `TwoPhaseCommit` directory as an Eclipse project and compile/run the program from there.

Upon running the program, one should be greeted with the interface pictured below.



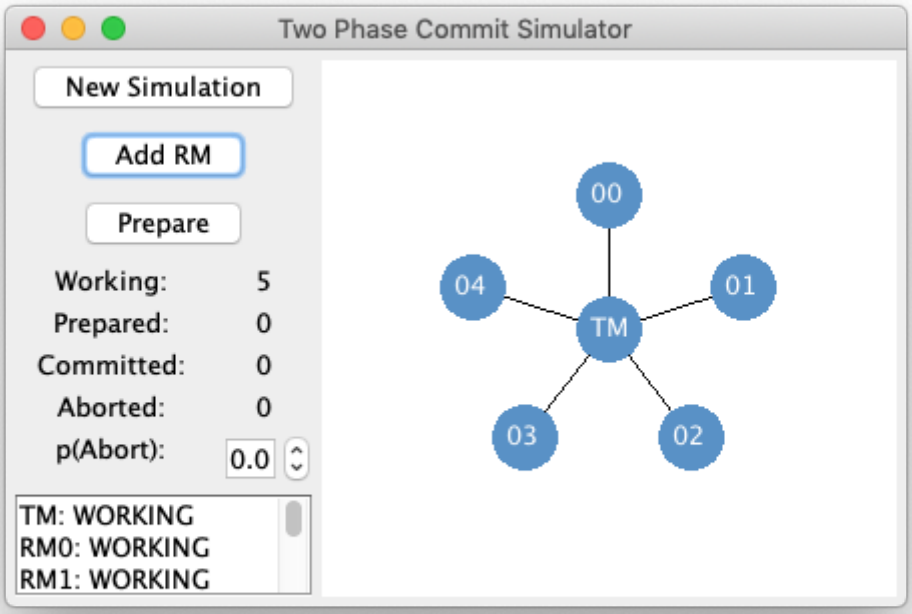
Usage

The purpose of the program is to give a visual representation of the two-phase commit algorithm for transaction consensus.

Adding Resource Managers

The program can simulate a transaction for an arbitrarily large distributed system (with one coordinating node, which is the **Transaction Manager** or **TM**). To add a resource manager node to the

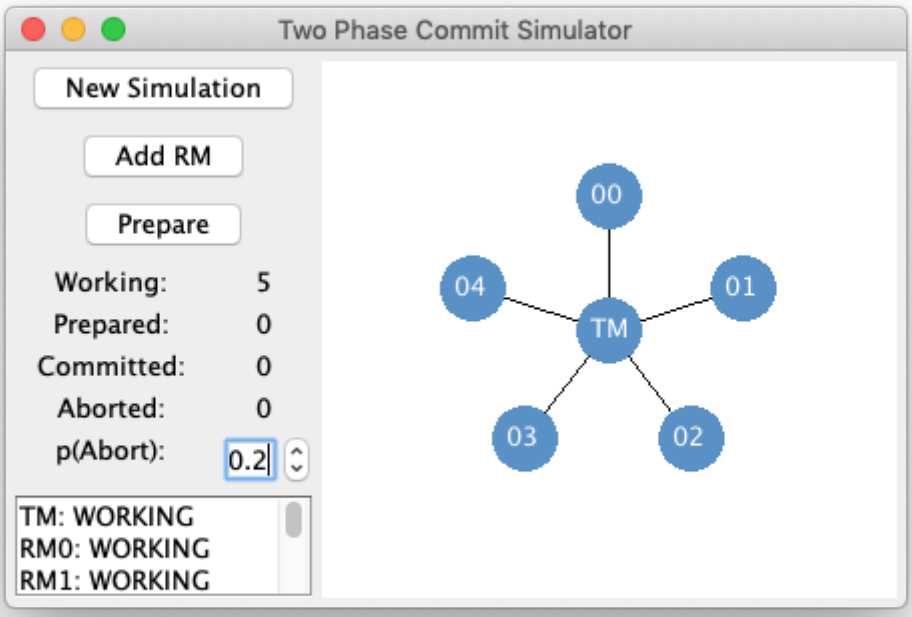
system, click the *Add RM* button. One can add as many nodes as ones likes, although one should be aware that each node runs on its own thread.



Changing Abort Probability

When we want to commit to a transaction across all nodes in a distributed system, we need to first verify that every node is able to commit. The *p(Abort)* spinner indicates the probability that each node, when asked to commit to a transaction, will not be able to do so and will instead enter the **Aborted** state.

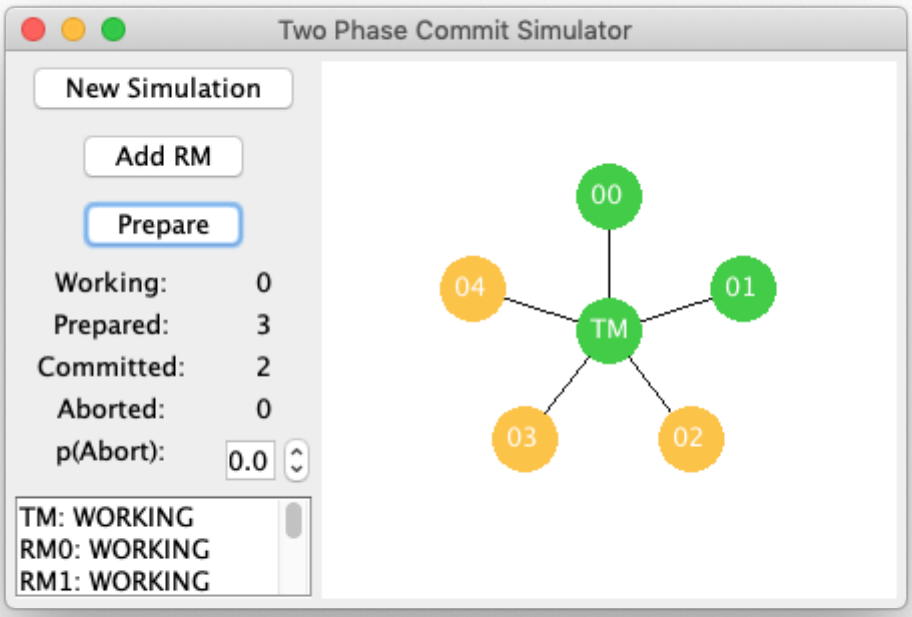
By default, the probability is set to 0. Using the spinner, a user can set this probability in increments of 0.1 from 0.0 to 1.0.



Initiating a Transaction

The *Prepare* button tells the system to try to commit to a transaction.

- If every node is able to successfully enter the **Prepared** state, then every node will eventually end up in the **Committed** state.
- If at least one node enters the **Aborted** state, then eventually every node will end up in the **Aborted** state.



The numbers on the left side of the window indicate how many nodes are in each state, and the log in the bottom left displays the events in the system. Both update in real time as the simulation progresses.

The graphical display on the right also updates in real time. As one can easily see when running the program, nodes change color according to their current state:

- Blue = **Working**
- Yellow = **Prepared**
- Green = **Committed**
- Red = **Aborted**

The log area at the bottom left of the window keeps a real-time list of the events that have occurred in the system, and can be copied and saved.

Resetting the Simulation

After a simulation has completed and all nodes are either **Committed** or **Aborted**, the user can press the *New Simulation* button to return to a blank slate with only a Transaction Manager process present. In this manner, one can change variables and repeat simulations as many times as one desires. Please note that the log area is cleared during a reset; any log data present will be lost if it is not copied to an external file.