CSS 434:

**Homework 3:**

Maryam M, October 2024.

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# Summary

Document algorithm including explanations and illustrations.

## UnixClient

## UnixAgent

# Execution Output

Results when using 2+ servers, each executing 4 commands.

## UnixClient

[Screenshot]

## UnixAgent

[Screenshot]

# Discussion

## (1) Programmability

Discuss about the total # LOC of UnixClient.java/UnixServer.java versus UnixAgent.java, difficulty in

your paradigm shift to agent programming, etc.

## (2) Performance Comparison

### Tests

* **Test 1:** Execute multiple commands (4 or 12 commands) at remote servers. This test intends to see how RMI client/servers VS. UWAgent would run longer with more commands.
* **Test 2:** Execute a grep at remote servers. This test finds all occurrences of a given string, (i.e., “123”) in text1.txt (with 10GB) at each remote server and prints out only the total number of occurrences at the client side.
* **Test 3 (RMI only):**  Download text1.txt (with 10GB) from each remote server, locally finds all occurrences of a given string, (i.e., “123”), and prints out the total number of occurrences at the client side.

**Note: Results are the fastest among 5 executions.**

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| --- | --- |
| **RMI** | **UWAgents** |
| **Test 1:**   |  |  |  | | --- | --- | --- | | #nodes | 4 commands | 12 commands | | 1 |  |  | | 2 |  |  | | 3 |  |  |   P 50763 #nodes cssmpi204 #commands who ls ps df | **Test 1:**   |  |  |  | | --- | --- | --- | | #nodes | 4 commands | 12 commands | | 1 |  |  | | 2 |  |  | | 3 |  |  |   java -cp UWAgent.jar:. UWAgent.UWInject -p 50763 localhost UnixAgent P #nodes cssmpi2-4 4 #commands who ls ps df |
| **Test 2:**   |  |  | | --- | --- | | #nodes |  | | 1 |  | | 2 |  | | 3 |  |   C 50763 #nodes cssmpi2-4 1 grep\ -o\ 123\ ../files/text1.txt | **Test 2:**   |  |  | | --- | --- | | #nodes |  | | 1 |  | | 2 |  | | 3 |  |   java -cp UWAgent.jar:. UWAgent.UWInject -p 50763 localhost UnixAgent C #nodes cssmpi2-4 grep\ -o\ 123\ ../files/text1.txt |
| **Test 3**   |  |  | | --- | --- | | #nodes |  | | 1 |  | | 2 |  | | 3 |  |   P 50763 #nodes cssmpi2-4 1 cat\ ../files/text1.txt | grep -o 123 | wc -l |  |

### Performance Conclusion

Discuss under what conditions UnixAgent.java outperforms UnixClient.java. You may tell that UnixAgent.java does not perform well at all, based on your experiment.

# Source Code

### UnixClient.java

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### UnixAgent.java

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