HW3 Report, Loggy: A Logical Time Logger

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September 21, 2025

1 Introduction

2 Main problems and solutions

2.1

2.2

2.3

3 Evaluation

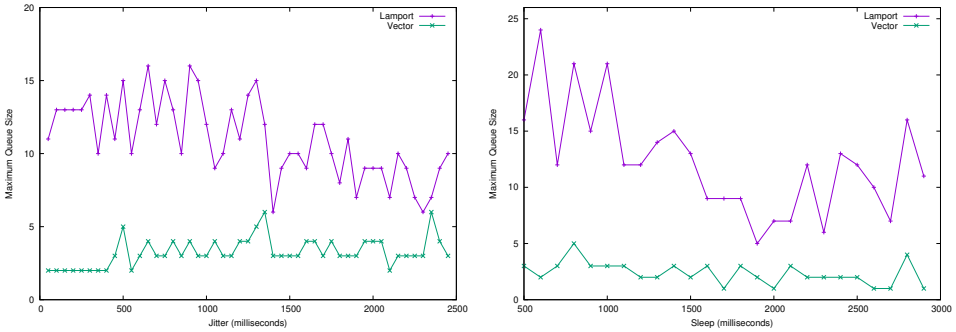
3.1 Visualization

To aid evaluation, a module *mermaid* was implemented to create visual representations of the messages flowing between the vector clocks.

See appendix. (TODO, proper sendoff to the appendix, google how)

3.2 Delay caused by Jitter Comparison of Lamport and Vector

Due to the inherit randomness of the *Loggy* implementation these results can't be taken as absolutes for corelating sleep or jitter to the maximum queue size, although the difference



(a) Comparison of Jitter using a 1500ms Sleep

(b) Comparison of Sleep using a 250ms Jitter

Figure 1: Queue size comparison between the clock implementations on different delays and jitters

4 Conclusions

5 Appendix

Both of these tests were completed using test:run(¡module¿, 1500, 500).

5.1 Lamport Clock

```
119> test:run(time, 1500, 500).
loggy: starting with module time
log: s:5   ringo  sending  ( 24) c:1
log: s:5   john   sending  (  6) c:1
log: s:5   george sending  ( 26) c:1
log: s:2   paul   received ( 24) c:2
log: s:2   john   received ( 26) c:2
log: s:2   paul   received (  6) c:3
log: s:2   john   sending  ( 50) c:3
log: s:2   ringo  received ( 50) c:4
log: s:2   john   sending  ( 73) c:4
log: s:2   paul   sending  ( 28) c:4
log: s:8   george received ( 28) c:5
log: s:8   ringo  sending  (  2) c:5
log: s:8   john   sending  ( 37) c:5
log: s:13  george received ( 73) c:6
log: s:13  paul   received (  2) c:6
log: s:13  john   sending  (  1) c:6
log: s:3   george sending  ( 48) c:7
log: s:3   paul   sending  ( 30) c:7
log: s:3   ringo  received ( 48) c:8
log: s:3   paul   received ( 37) c:8
log: s:3   ringo  sending  ( 86) c:9
log: s:3   george received ( 86) c:10
log: s:3   george received ( 30) c:11
log: s:3   george sending  ( 85) c:12
log: s:3   ringo  received ( 85) c:13
log: s:3   ringo  sending  ( 83) c:14
log: s:3   george received ( 83) c:15
log: s:3   ringo  received (  1) c:15
```

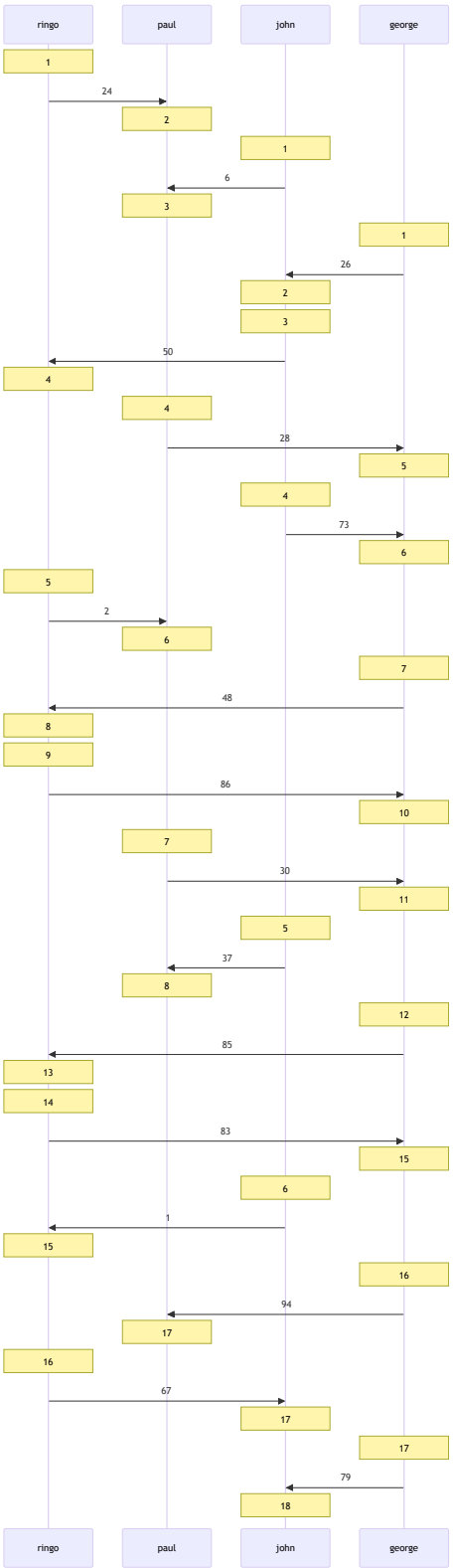


Figure 2: Sequence visualization of the Lamport timestamp algorithm

5.2 Vector Clock

```
120> test:run(vect, 1500, 500).
loggy: starting with module vect
log: s:1   ringo  sending  ( 24) c:ringo => 1
log: s:1   paul   received ( 24) c:paul => 1,ringo => 1
log: s:0   john   sending  (  6) c:john => 1
log: s:0   paul   received (  6) c:john => 1,paul => 2,ringo => 1
log: s:0   george sending  ( 26) c:george => 1
log: s:0   john   received ( 26) c:john => 2,george => 1
log: s:0   john   sending  ( 50) c:john => 3,george => 1
log: s:0   ringo  received ( 50) c:john => 3,ringo => 2,george => 1
log: s:2   john   sending  ( 73) c:john => 4,george => 1
log: s:0   paul   sending  ( 28) c:john => 1,paul => 3,ringo => 1
log: s:0   george received ( 28) c:john => 1,paul => 3,ringo => 1,george => 2
log: s:0   george received ( 73) c:john => 4,paul => 3,ringo => 1,george => 3
log: s:0   ringo  sending  (  2) c:john => 3,ringo => 3,george => 1
log: s:0   paul   received (  2) c:john => 3,paul => 4,ringo => 3,george => 1
log: s:0   george sending  ( 48) c:john => 4,paul => 3,ringo => 1,george => 4
log: s:0   ringo  received ( 48) c:john => 4,paul => 3,ringo => 4,george => 4
log: s:1   john   sending  ( 37) c:john => 5,george => 1
log: s:1   paul   received ( 37) c:john => 5,paul => 5,ringo => 3,george => 1
log: s:0   ringo  sending  ( 86) c:john => 4,paul => 3,ringo => 5,george => 4
log: s:0   george received ( 86) c:john => 4,paul => 3,ringo => 5,george => 5
log: s:2   george sending  (  8) c:john => 4,paul => 3,ringo => 5,george => 6
log: s:1   ringo  sending  ( 84) c:john => 4,paul => 3,ringo => 6,george => 4
log: s:1   paul   received ( 84) c:john => 5,paul => 6,ringo => 6,george => 4
log: s:1   paul   received (  8) c:john => 5,paul => 7,ringo => 6,george => 6
log: s:1   paul   sending  ( 46) c:john => 5,paul => 8,ringo => 6,george => 6
log: s:1   george received ( 46) c:john => 5,paul => 8,ringo => 6,george => 7
log: s:1   john   sending  (  1) c:john => 6,george => 1
log: s:1   ringo  received (  1) c:john => 6,paul => 3,ringo => 7,george => 4
log: s:0   george sending  ( 99) c:john => 5,paul => 8,ringo => 6,george => 8
log: s:0   paul   received ( 99) c:john => 5,paul => 9,ringo => 6,george => 8
```

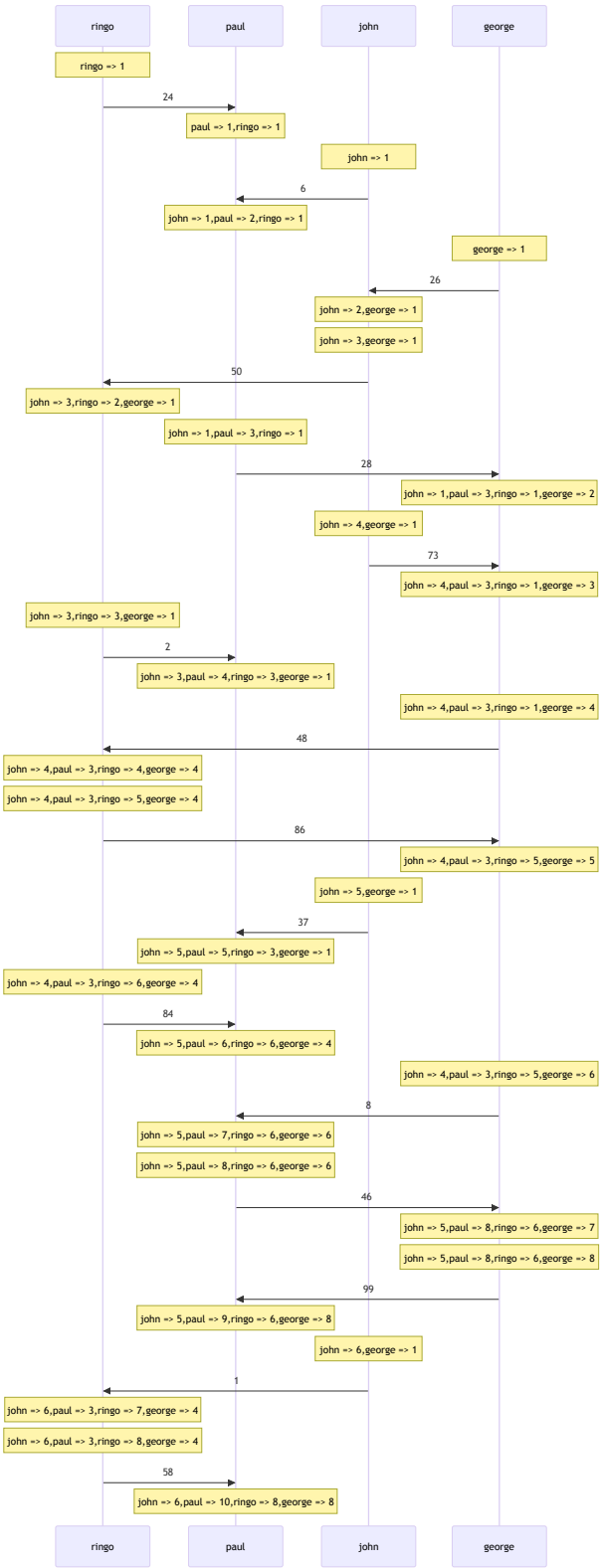


Figure 3: Sequence visualization of the vector clock implementation