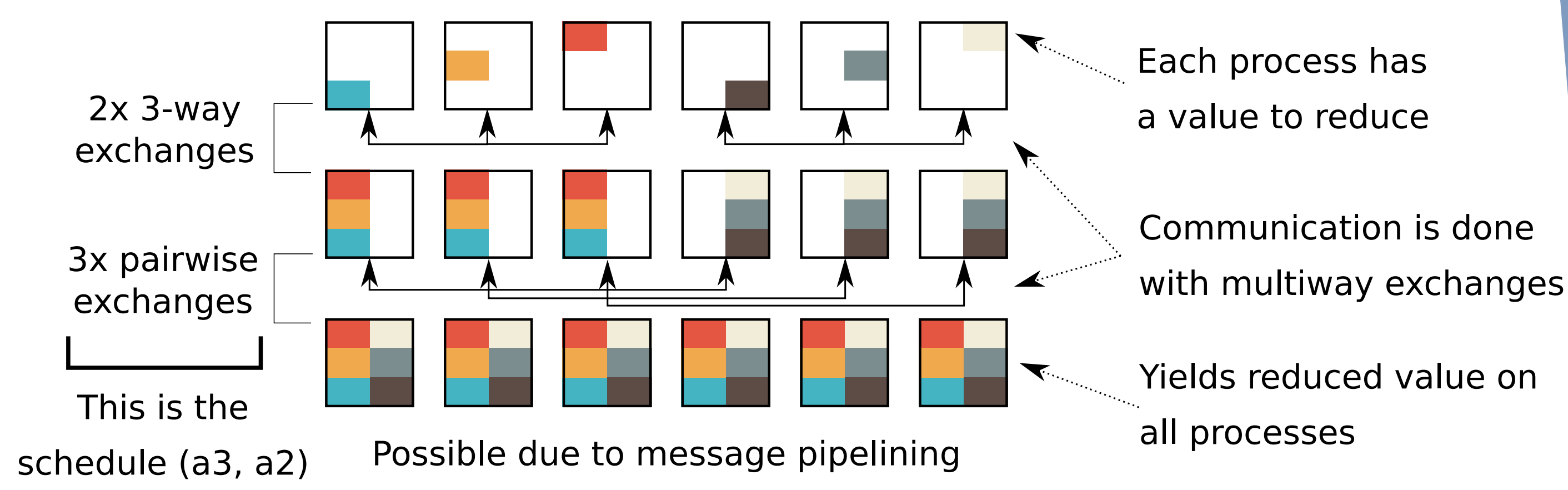
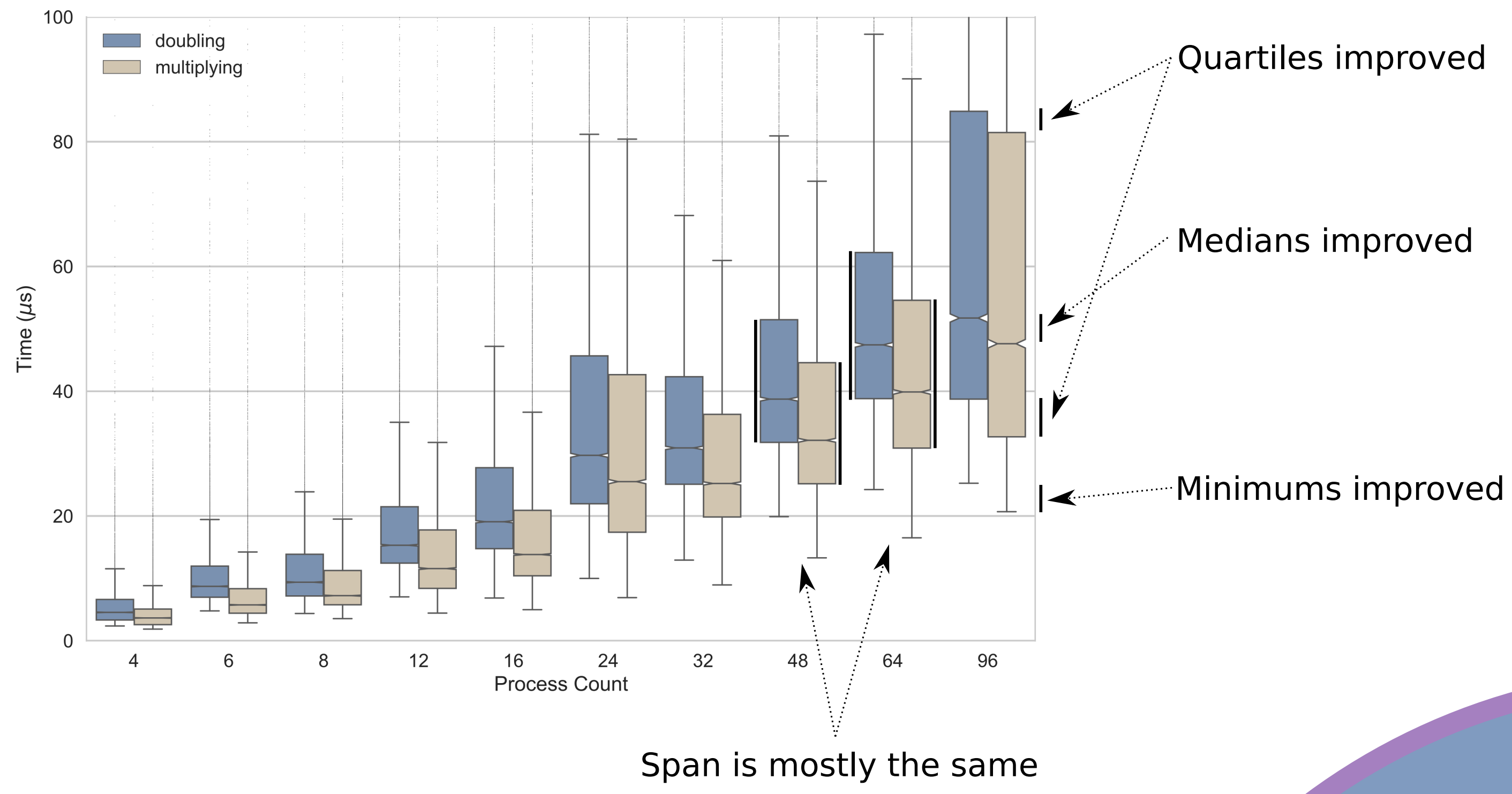


Challenge

We have Recursive Multiplying:



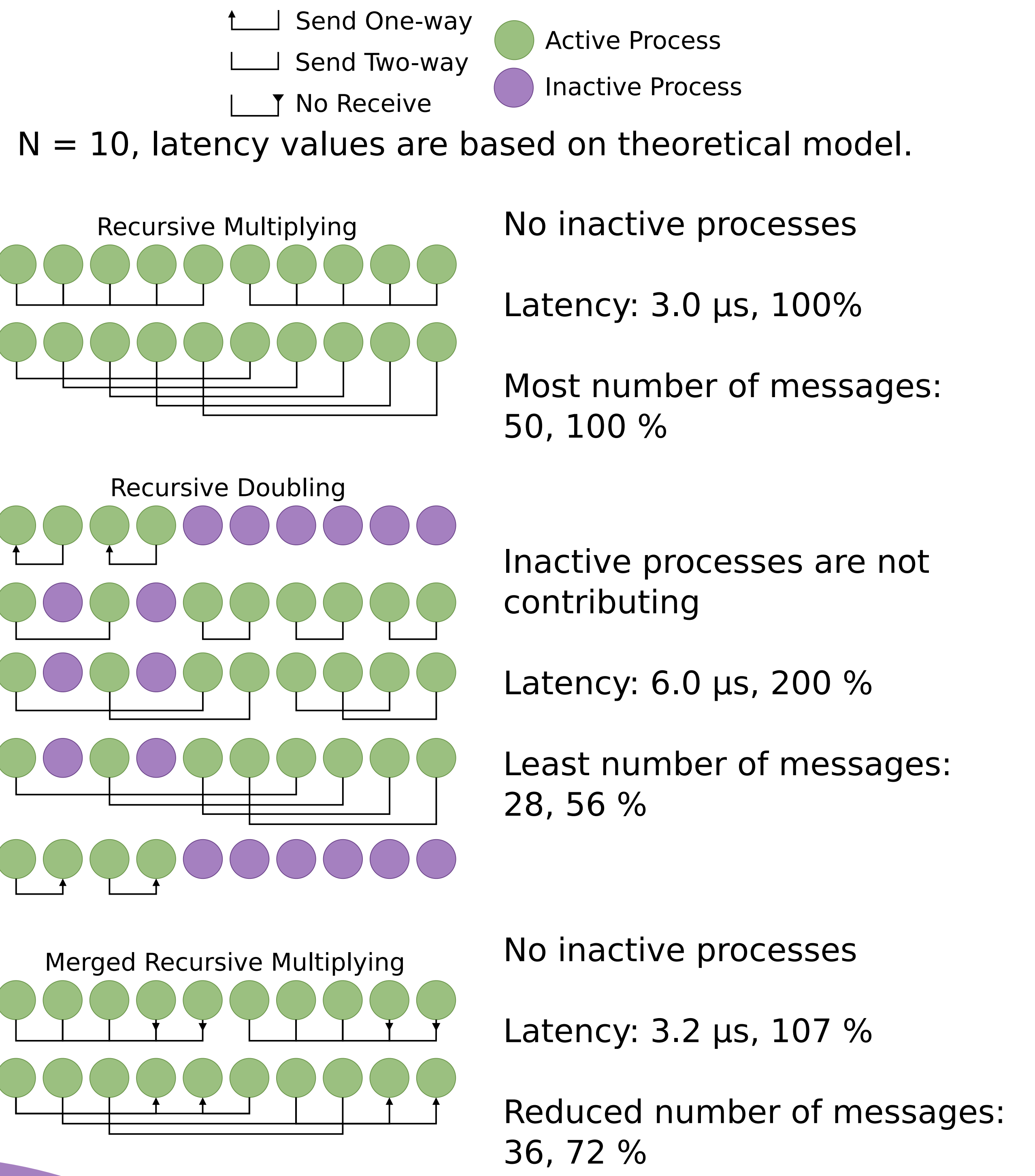
Recursive Multiplying outperforms Recursive Doubling



Problems:

- Long tails of the distributions
- Only intended for small message sizes

Can we trade off costs?

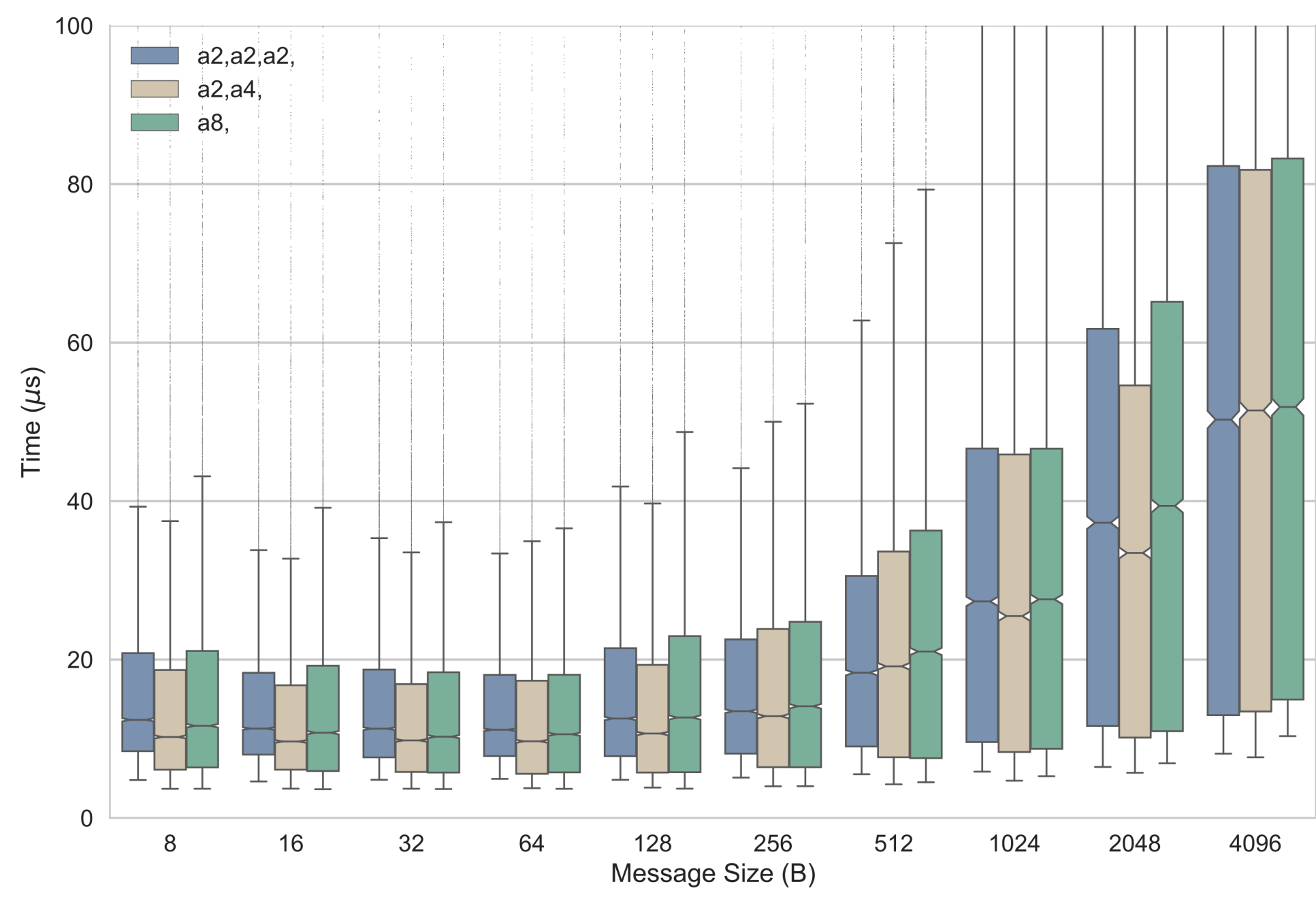


- Yes, we can use different schedules to trade off between latency and message count.

Recursive Multiplying More Flexible Than Expected

Martin Ruefenacht
Mark Bull
Stephen Booth

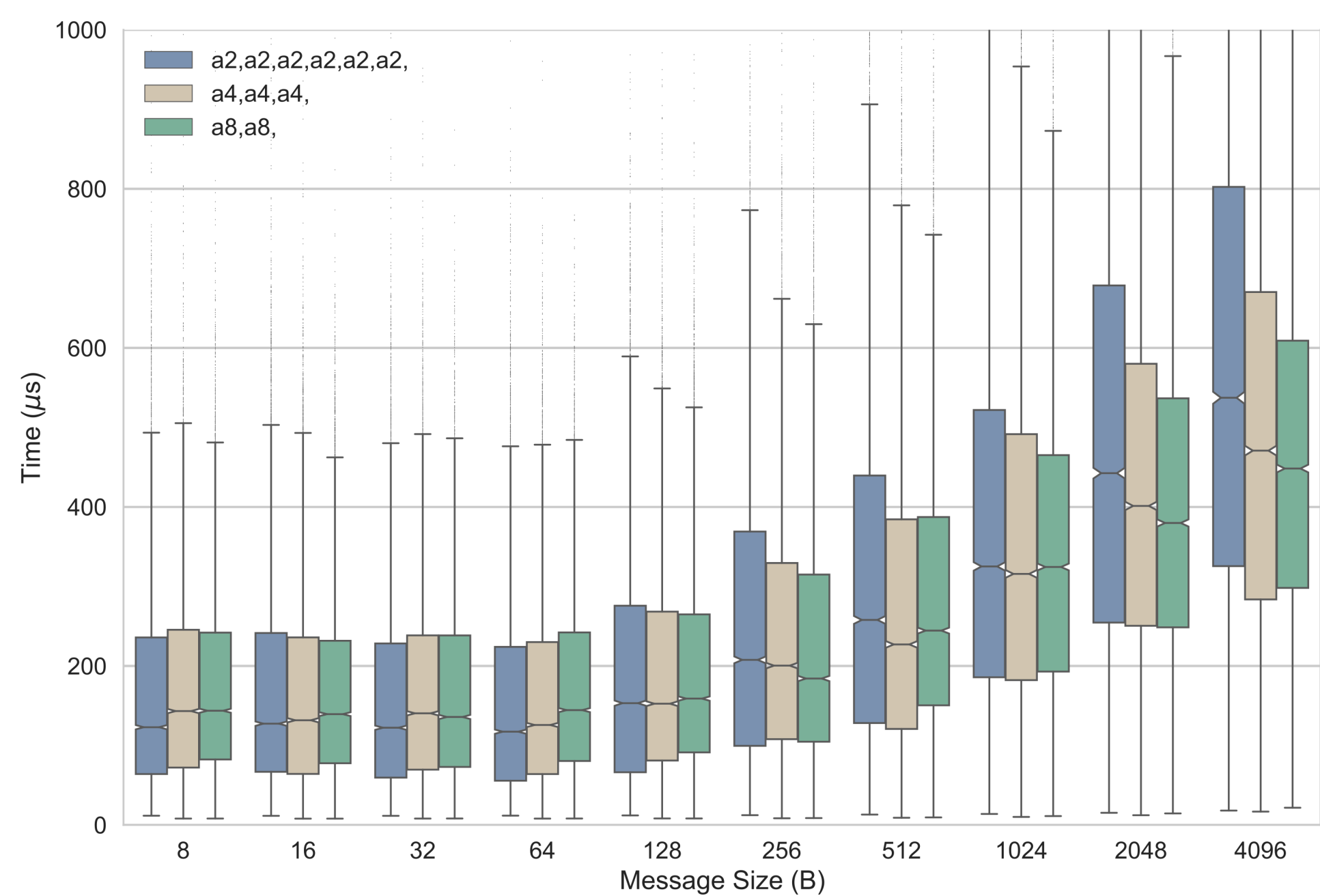
How far can we push the size?



- No clearly superior schedule to use for message size.
- Dense schedules perform well up to 4 kB.

Degenerate schedules, any order is equivalent.

Best schedule does not seem to be influenced by ordering.



- Divergence between schedules is opposite of expected.
- Recursive Doubling should outperform other schedules due to low bandwidth.

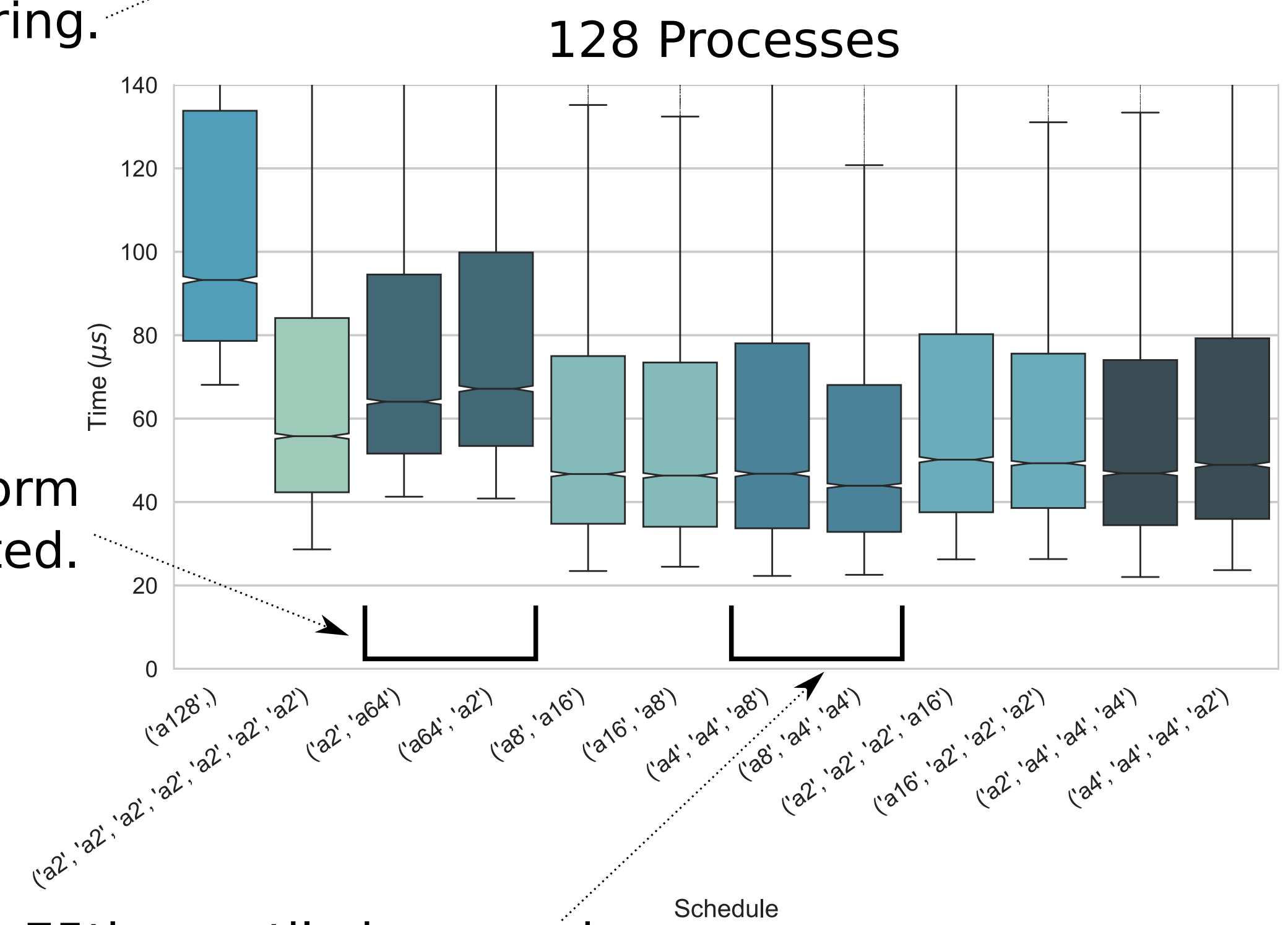
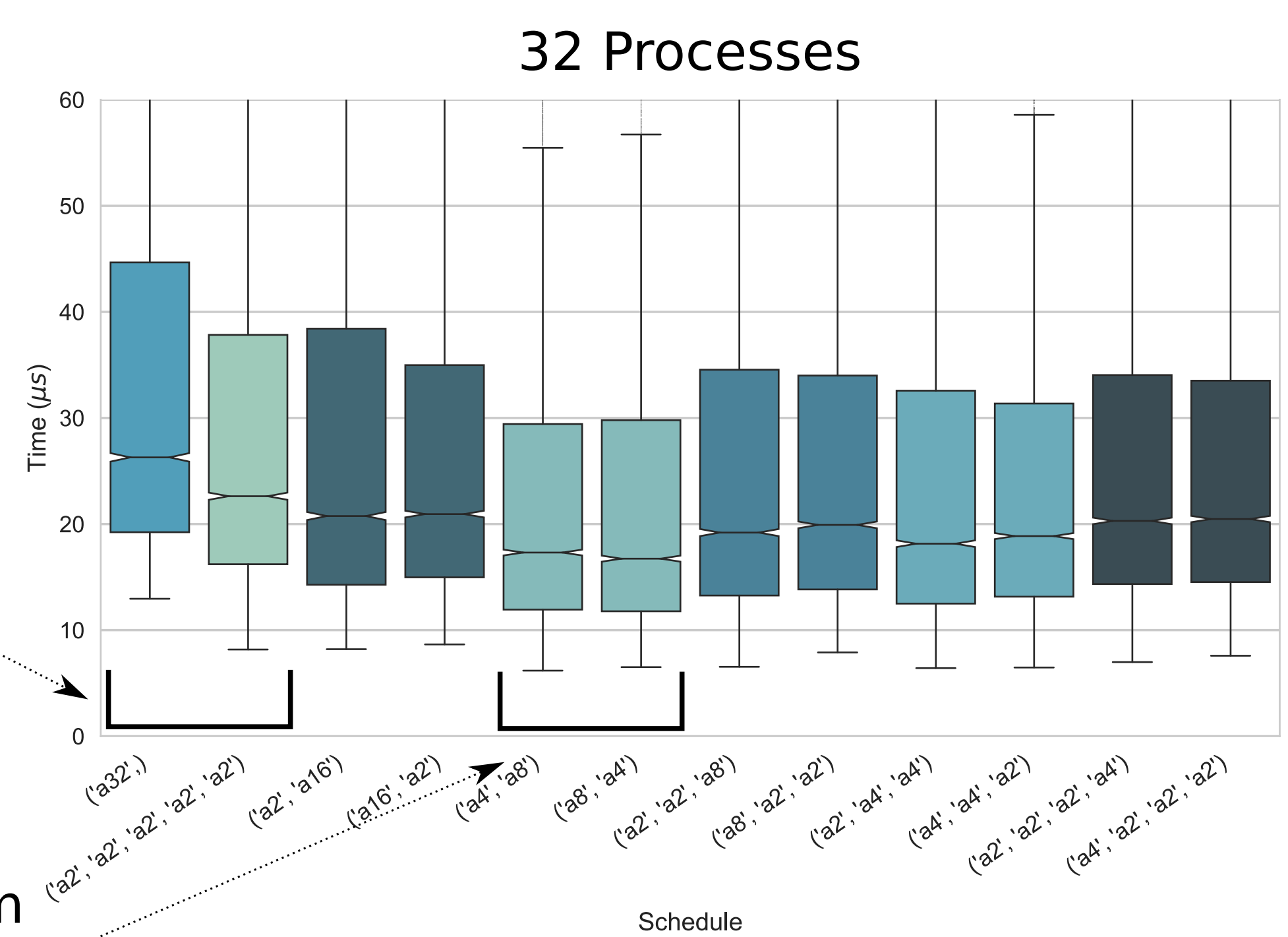
Some schedules perform opposite to expected.

Best schedule 75th quartile improved by 12.7% with specific ordering.

- Yes, the best schedules are descendingly ordered.

Does schedule order matter?

Same color = same schedule set



- Surprisingly, as far as Recursive Doubling which is not used above 4KB with better results.

All results shown are from ARCHER, Cray XC30, with the default environment.