Doing Stuff to Windows Yet Again

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Abstract

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1 Introduction

Research questions:

- How does the compiler, temperature and background process impact the energy consumption?
- What is the best measuring instrument for Windows?
- *How well does microbenchmarks represent a realistic usecase compared to macrobenchmarks?*
- How does parallelism affect the energy consumption
- How does P-cores and E-cores effect the execution of parallelism in a process, versus only P-Cores?
- *How can measuring instruments be calibrated to better fit a ground truth*

Hypothsis:

- The expectation for the compilers are that the performance and energy consumption will be similar, but with some deviations. Resulting from the individual compilers implementation.
- The expectation for the temperature is that it in itself would not effect the performance unless the cpu starts to thermal throttle. Though the heat of the cpu is directly related to the electrical resistance meaning that it would be less efficient in terms of joule per computation.
- We do not expect the background process to have a large impact on the energy consumption, this mostly because the non-essential background process are executed rarely and for very brief durations. We do expect that the results will become more consistent without
- We know that IPG and LHW are very similar and we expect Windows RAPL driver to be similar as well.
- We expect that using parallelism there is not a correlation between execution time and energy consumption.
- We expect if we can get the right thread to run on a E core that it could improve energy consumption slightly depending on the size of the benchmark. Where the larger the benchmark the bigger the improvement in energy consumption.
- We expect the calibration to be very situation specific, where the calibration might improve the measurements in some cases, but not in others.

2 Related Works

3 Experiments

4 Results

5 Discussion

6 Conclusion

Acknowledgements

7 Future Works

References