

# Performance Measurement of Personal Computer

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**Abstract**—In this report we describe a set of experiments performed to benchmark the performance of a typical personal computer. The benchmarking is not a performance estimation based on hardware specification - we have measured the different overheads levied by the OS and determined the hardware constraints to gain a true perspective of the system performance. The report details out the experiments and analyzes the results to draw conclusions about the performance of the system being tested.

## I. INTRODUCTION

Specifications of a computer system does not always convey it's true performance. The hardware and operating system introduces various overheads which constrains performance. The measure of these overheads are important as they help benchmark the true performance of any system. This knowledge is important for developers as their application runs atop the operating system and heavily uses the services provided by it; thus any bottlenecks in the OS will translate into their applications and degrade performance. Also, the OS determines the baseline "responsiveness" the user expects from the system and applications should not be far from this baseline to ensure smooth customer experience.

### A. Goals

Our primary goal was to benchmark the CPU and memory in details and analyze the results to draw conclusions about their performance. The CPU experiments are designed and implemented by Anubhab Majumdar. Arun Jaganathan designed the experiments to test memory components and implementation was shared by both the authors.

### B. Language

We used trusty C language to design and implement the experiments. The code was compiled with **Apple LLVM version 7.3.0 (clang-703.0.31)** with no optimizations because we wanted the assembly code to be in order of our original program.

### C. Duration

We worked on this project for around 70 hours spanning over 3 weeks. This includes determining the deliverables, reading relevant research papers, designing the experiments, coding the experiments, data consolidation, analysis of the data and drafting this report.

## II. MACHINE DESCRIPTION

We have tested one of our personal computer, a MacBook Air. Following are the details of the machine:

- 1) **Model Name:** MacBook Air
- 2) **Model Identifier:** MacBookAir7,2
- 3) **Processor Name:** Intel Core i5
- 4) **Processor Speed:** 1.6 GHz
- 5) **Number of Processors:** 1
- 6) **Total Number of Cores:** 2
- 7) **L2 Cache:** 128 KB
- 8) **L3 Cache:** 768 KB
- 9) **Memory:** 8 GB
- 10) **Memory Type:** DDR3
- 11) **Memory Speed:** 1600 MHz
- 12) **Memory bus speed:** 1066 MHz
- 13) **Link Speed:** 5.0 GT/s
- 14) **Link Width:** x4
- 15) **Storage:** 128 GB
- 16) **Medium Type:** Solid State Drive

## III. CONCLUSION

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## APPENDIX A

### PROOF OF THE FIRST ZONKLAR EQUATION

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The authors would like to thank...

#### REFERENCES

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