

# LLVM vs JITBuilder: Measuring and Comparing the Overhead of two API-based JIT Frameworks

Eric Coffin

Faculty of Computer Science  
University of New Brunswick  
Fredericton, NB, Canada  
eric.coffin@unb.ca

## ABSTRACT

Just-in-Time compilation has allowed for significant performance gains during the run-time of applications. LLVM can be embedded within an application to allow JIT compilation during run-time. Similarly, the OMR JIT compiler can be embedded within an application. Both frameworks offer simple, programmer interfaces to define and generate native methods at run-time. In this report we discuss the different approaches the two frameworks employ. We then measure the overhead associated with each framework while compiling relatively simple functions. We found that while LLVM required a significantly larger memory footprint, it was able to generate code more quickly. Furthermore, the code LLVM generated was by default more optimized. By configuring JITBuilder, we were able to reduce the compilation time significantly, however it still was above that of LLVM.

## CCS CONCEPTS

• **Software and its engineering** → **Compilers**.

## KEYWORDS

compilers, just-in-time, optimization

## 1 INTRODUCTION

Introduction

## 2 BACKGROUND

### 2.1 LLVM

LLVM.

### 2.2 JITBuilder

JITBuilder.

## 3 METHODOLOGY

Methodology

## 3.1 Results

## 4 RELATED WORK

Related work.

## 5 FUTURE WORK

Future Work

## 6 SUMMARY

Summary

## 7 ACKNOWLEDGEMENTS

This research was conducted within the Centre for Advanced Studies—Atlantic, Faculty of Computer Science, University of New Brunswick. The authors are grateful for the colleagues and facilities of CAS Atlantic in supporting our research. The authors would like to acknowledge the funding support provided by the Atlantic Canada Opportunities Agency (ACOA) through the Atlantic Innovation Fund (AIF) program. Furthermore, we would also like to thank the New Brunswick Innovation Foundation for contributing to this project.

## REFERENCES

---

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from [permissions@acm.org](mailto:permissions@acm.org).

*Conference'17, July 2017, Washington, DC, USA*

© 2020 Association for Computing Machinery.