Summary
A Survey of Adaptive Optimization in Virtual Machines
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1 To be completed before class

What are the problems solved by this paper? (50 words)

This paper surveys the current state of the art technologies for adaptive optimizations in Virtual Machines. The challenges involving VM are as the following: First, portable program representations and dynamic language features force optimizations at runtime which present runtime optimization overhead. Second, modular program representations preclude many forms of whole-program interprocedural optimization. Third, virtual machines incur additional costs for runtime services.

What are the approaches attempted by this paper? (50 words)

The authors do not propose any new technology in this paper. They study existing technologies of selective optimization through run-time compilation, feedback directed optimization and code generation by collecting profiles or analysing phases.

What are the main conclusions of this paper? (50 words)

The authors observed that employment of adaptive optimization strategies in many Virtual environments. Selective optimizations has been implemented more in the production systems while feedback techniques are yet to be incorporated. The authors propose that researchers can build on a number of high-quality open-source VMs such as Jikes RVM, Mono and ORP environments.

2 To be completed after class

Did this paper address an important issue? Explain. (100 words)

The authors review the adaptive optimization technologies developing in industry and research. Recent program languages like Java and C# are targeting portability across machines and program optimizations are being delayed to run-time. Achieving performance requires a good flexible Intermediate Representation (DIR) which can then be optimized to DER at run time. The authors study various techniques of optimization developed from profiling based approaches which optimize run-time code to code generation so as to improve the locality of data and programs. The authors are thereby trying to predict the direction in which the technology will develop.

Are the proposed approaches valid? Describe its strength and weakness. (100 words)

This is a survey of existing technologies. The authors do not propose any new technology in this paper. They authors are understanding the different methods of improving performance by recompilation of run time code. All these techniques require run-time compilation requiring the technique to take less overhead while assuring performance. The paper does not discuss the consequences of the technologies in detail and only skims through a range of topics and methodologies.
Do the results support the conclusions? Explain. (100 words)

This is a survey of existing technologies and no results are presented in this paper. The conclusions are drawn from surveying the various adaptive optimization techniques developed in the past few years targeting to make code secure and portable. The increasing employment of adaptive technologies indicate a vital importance in the future.

Describe the potential future works? (100 words)

The survey could be employed to integrate the existing technologies to develop a very light adaptive optimizing technology which gives good performance. It could be used to develop run-time optimizers which employ existing resources to collect profiles and optimize the code. A suitable IR which can be easily modified can be developed.