

Dynamic Compilation: Panacea or Necessary Evil?

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Abstract

Dynamic compilation is receiving growing interest from computer architects, compiler writers and software developers alike. Dynamic compilation systems provide a much needed solution to various problems ranging from transparent software migration to the efficient implementation of novel mobile programming languages. The appeal of dynamic compilation lies in the ability to alter an executing program binary. While under the control of a dynamic compiler, running program binaries can be adapted continuously and transiently to the actual runtime program behavior and the current architectural environment. Dynamic compilation promises many improvements from simple performance optimization to revolutionizing the way we design architectures and the way we develop and distribute software. Yet, the current state of affairs is still far behind this vision leaving grounds for skepticism. This talk will discuss the many challenges and promises of dynamic compilation and will point to some of the steps that are needed to propel its next advances.

Evelyn Duesterwald is a Senior Research Scientist at Hewlett Packard Laboratories. She is a chief architect of Dynamo, a runtime optimization system developed at HP Laboratories in Cambridge, Mass. She holds several pending patents on dynamic optimization and has numerous research publications in the areas of dynamic and static compiler optimizations, program analysis, and software development tools. She received her undergraduate degree from the University of Bonn, Germany in 1988 and a M.S. and Ph.D. degree in Computer Science from the University of Pittsburgh in 1991 and 1996.