Flang

The Fortran programming language is an essential component of many exascale applications and broad scientific missions within the US Department of Energy (DOE). Until recently, Fortran has not had the benefit of using the widely leveraged LLVM Compiler Infrastructure and the vibrant community that supports it. By leveraging a multi-year investment made by the National Nuclear Security Administration's (NNSA's) Advanced Simulation and Computing (ASC) program to establish Fortran as a component of the LLVM infrastructure, the Flang project aims to build upon this foundation and further the capabilities and feature set of Fortran as a first-class language in the LLVM community. This will provide developers with a viable and robust path forward for producing performant Fortran-based applications on DOE's pre-exascale and exascale system architectures.

The Flang project focuses on taking a key role in contributing to the recently accepted open-source LLVM-based Fortran front-end ("Flang") established by a multi-year investment made by the NNSA's ASC program. By contributing to the overall community effort, the infrastructure will provide support for the critical features needed by Fortran applications to obtain performance on pre-exascale and exascale architectures, such as accelerator offload, improved optimizations, and tooling. This effort will help to establish a modernized Fortran environment that will provide a robust and productive infrastructure for mission-critical applications within the DOE and across other US agencies and industry, where Fortran applications are essential for national security, scientific discovery and engineering design.

Progress to date

Project officially starts October 1, 2019

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