

D-TEC – “DSL Technology for Exascale Computing”

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D-TEC will define approaches to construct Domain Specific Languages (DSLs). Different sorts of DSLs will be targets for this work; DSLs constructed from existing languages without syntax extension (embedded DSLs) and DSLs with syntax extension to existing base languages. Within each case, we will use common general-purpose languages (e.g. C, C++, Fortran) as base languages from which to build DSLs. A focus of this work is to lower the barriers to the compiler construction and program analysis required to support DSLs in the future. Our work will make future Exascale software development easier by defining how to bury the details (e.g. power management, resiliency, and exotic node architectures) that we anticipate future software to be forced to address behind well-defined abstractions. Our team includes expertise in runtime-systems, compiler research, static and dynamic optimization, tools, and HPC applications; gathered from multiple universities and national laboratories. Our work serves the requirements of the DOE Exascale program and is work in collaboration with other Exascale Co-Design Centers and X-Stack projects.

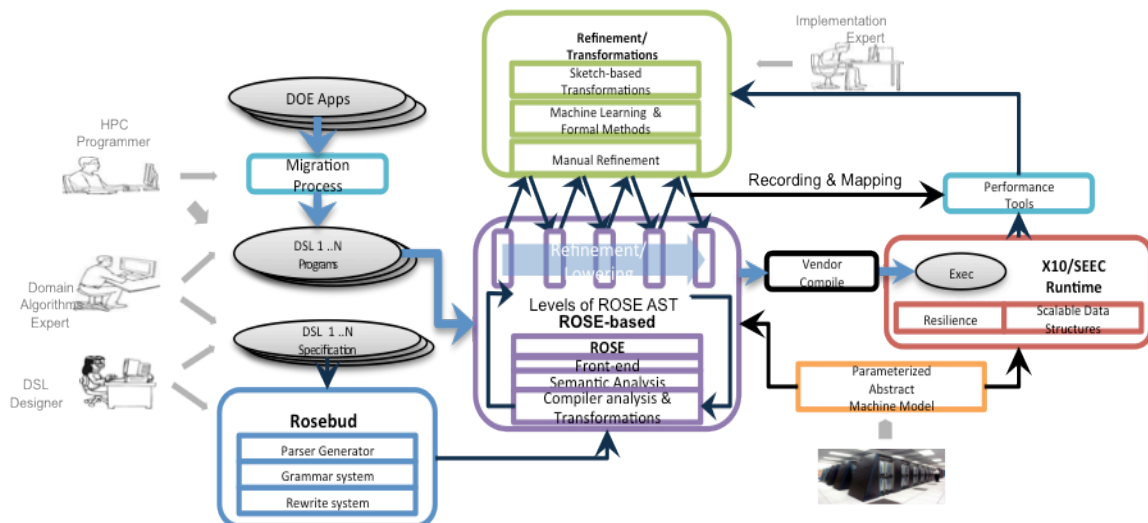
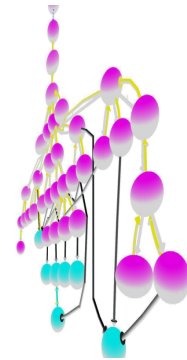


Figure 1: Workflow for development and use of DSLs for Exascale software development.

D-TEC will be releasing software to support the development of future exascale software. D-TEC software will be publically available open source, under a BSD license, with documentation, and mailing list support, and more, at: www.dtec-xstack.org.

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