

GPU Code

OpenCL™

NVIDIA CUDA™

Kernel Code

Host Code

Front-end Compiler



Semantic Analyzer

IR Generator

Semantic-aware Code Optimization

Memory Structure Handling

Function Call Analysis

Built-in library
(e,g math)

Built-in Library Linking

Host Code Compilation

Semantic Analyzer

Host Runtime for HW
Target Translator

Runtime Lib Linking

Thread Scheduling Code Generation

Parallel Region Analysis

Thread Schedule Code Generator

Middle-end Compiler



General Code
Optimizations

Divergence Management

Divergence Tracker

Uniformity Analysis

Opt and Transformation

Divergence Management Function Insertion

Back-end Compiler



RISCV ISA Table

Target Code Generation and Opt

Vortex Binary



Kernel Binary

Host Binary