The LLVM Parallel Universe Project for openEuler What We Learned from openEuler RISC-V ?
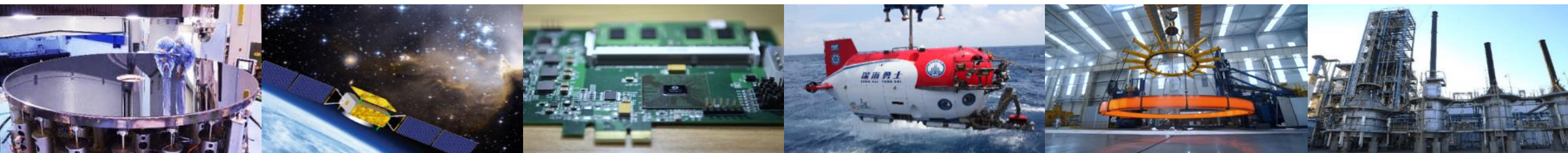
LLVM Parallel Universe (openEuler&ISCAS, Since 2023)

Jingwei Wang wangjingwei@iscas.ac.cn

Engineer at the Institute of Software, Chinese Academy of Sciences

Member of the Technical Committee of the openEuler Community

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LLVM Parallel Universe (openEuler, Since 2023)

Replacing GCC with LLVM for building openEuler.

"Parallel Universe": Runs alongside the GNU version release.

Progress:

- UEFI preview for RISC-V (64-core SG2042).
- Passed 10,000+ kernel tests.
- Validated 4,000+ packages with no critical LLVM issues.
- Slight performance gains.

Future: Stable releases & 6000+ packages & RVA23 profile

Geometric Mean Of All Test Results
Result Composite - AMD EPYC Genoa Compilers
Phoronix.com
Geometric Mean, More Is Better
GCC 13.1.1 — 714.19
Clang 16.0.3 — 739.69
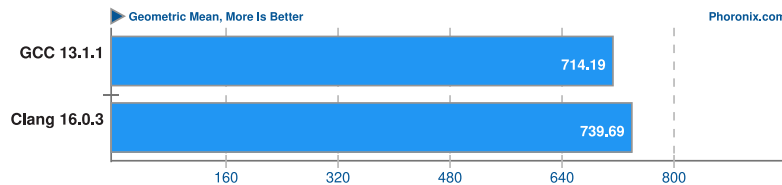
Geometric Mean Of All Test Results
Result Composite - Clang LTO Linux Kernel Build Intel Benchmarks
Phoronix.com
Geometric Mean, More Is Better
Clang Built + LTO — 131.36
Clang Built — 127.94
GCC Built — 120.59
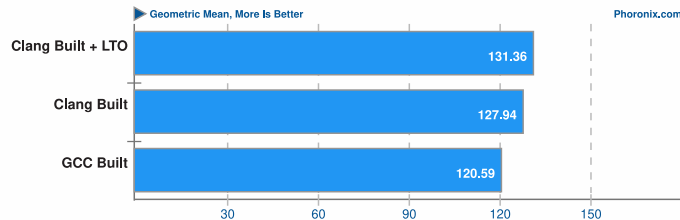
Number Of First Place Finishes

Wins - 131 Tests

GCC 13.1.1 — 42.75%
Clang 16.0.3 — 57.25%
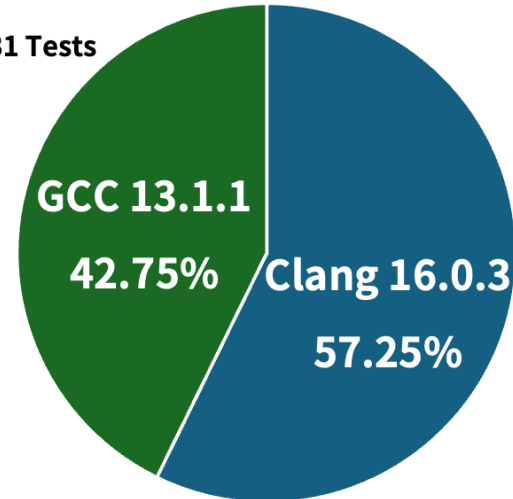
Number Of First Place Finishes

Wins – 23 Tests

Clang Built — 4%
GCC Built — 9%
Clang Built + LTO — 87%

Source Code

Upstream

Upstream First | Pkg / Patch | Submit

gitee

openEuler Community

openeuler/

src-openeuler/

Upstream First | Fork / Patch | Submit

openeuler-risc-v/

Sig-RISC-V Midstream Repo

RPM Spec Src Tarball

Building

openEuler Eulermaker

Eulermaker Server / Scheduler

Eulermaker Worker Cluster

openEuler x86_64 | openEuler riscv64 | openEuler aarch64

Metadata

RPMs

Sig-RISC-V **Open Build Service** Instance

Self-hosted OBS Server / Scheduler

OBS Worker Cluster

openEuler x86_64 | openEuler riscv64 | openEuler aarch64

Metadata

RPMs

QA & Release

Day-to-Day Building

Image Generation
Daily-build or On-demand
by Sig-RISC-V GitLab CI

Automated Testing
by OEPKGS

Manual Retest
On-demand
by Sig RV

Storage
Sig-RISC-V Devel Repository

Distribution
ISCAS Open Source Mirror

Release

Image Generation
by oE Offical Jenkins CI

Automated Testing
by OEPKGS

Manual Retest
by LLVM P-U Members

Delivery & Distribution
openEuler Official Repository
& Open Source Mirrors