



AOCC 4.0 Release Notes

© 2022 Advanced Micro Devices, Inc. All rights reserved.

The information contained herein is for informational purposes only, and is subject to change without notice. While every precaution has been taken in the preparation of this document, it may contain technical inaccuracies, omissions and typographical errors, and AMD is under no obligation to update or otherwise correct this information. Advanced Micro Devices, Inc. makes no representations or warranties with respect to the accuracy or completeness of the contents of this document, and assumes no liability of any kind, including the implied warranties of noninfringement, merchantability or fitness for particular purposes, with respect to the operation or use of AMD hardware, software or other products described herein. No license, including implied or arising by estoppel, to any intellectual property rights is granted by this document. Terms and limitations applicable to the purchase or use of AMD's products are as set forth in a signed agreement between the parties or in AMD's Standard Terms and Conditions of Sale. Any unauthorized copying, alteration, distribution, transmission, performance, display or other use of this material is prohibited.

Trademarks

AMD, the AMD Arrow logo, AMD AllDay, AMD Virtualization, AMD-V, PowerPlay, Vari-Bright, and combinations thereof are trademarks of Advanced Micro Devices, Inc. Other product names used in this publication are for identification purposes only and may be trademarks of their respective companies.

Dolby is a trademark of Dolby Laboratories.

HDMI is a trademark of HDMI Licensing, LLC.

HyperTransport is a licensed trademark of the HyperTransport Technology Consortium.

Microsoft, Windows, Windows Vista, and DirectX are registered trademarks of Microsoft Corporation in the US and/or other countries.

MMX is a trademark of Intel Corporation.

OpenCL is a trademark of Apple Inc. used by permission by Khronos.

PCIe is a registered trademark of PCI-Special Interest Group (PCI-SIG).

USB Type-C® and USB-C® are registered trademarks of USB Implementers Forum.

Reverse engineering or disassembly is prohibited.

USE OF THIS PRODUCT IN ANY MANNER THAT COMPLIES WITH THE MPEG ACTUAL OR DE FACTO VIDEO AND/OR AUDIO STANDARDS IS EXPRESSLY PROHIBITED WITHOUT ALL NECESSARY LICENSES UNDER APPLICABLE PATENTS. SUCH LICENSES MAY BE ACQUIRED FROM VARIOUS THIRD PARTIES INCLUDING, BUT NOT LIMITED TO, IN THE MPEG PATENT PORTFOLIO, WHICH LICENSE IS AVAILABLE FROM MPEG LA, L.L.C., 6312 S. FIDDLERS GREEN CIRCLE, SUITE 400E, GREENWOOD VILLAGE, COLORADO 80111.

Contents

Contents	3
Introduction	4
Release Highlights	4
Fortran	4
Fortran 2008 Compliance Improvements	4
Fortran OMP 4.5 Compliance Improvements	4
Fortran Debuggability	4
C/C++	4
Infrastructure	5
Others	5
Errata	5

Introduction

AOCC 4.0 is based on LLVM 14.0.6 release (llvm.org, 24th June 2022). It includes support for AMD “Zen4” generation architecture, various new features, and bug fixes mentioned below.

Release Highlights

Fortran

Fortran 2008 Compliance Improvements

Includes support for:

- Data declaration of allocatable components of recursive type and implied shape arrays
- I/O go edit descriptor
- Omitting an allocatable component in a structure constructor for accessing data objects
- Multiple allocations with SOURCE= in accessing data objects
- Listing Empty contains section in programs and procedures

Fortran OMP 4.5 Compliance Improvements

- \$omp teams and \$omp distribute directives support
- \$omp taskloop and \$omp target directives improvement

Fortran Debuggability

Debug support for private variables inside an OpenMP task construct

C/C++

Upgraded to Clang version 14.0.6. For new features, refer to LLVM Release Notes (<https://releases.llvm.org/14.0.0/tools/clang/docs/ReleaseNotes.html>).

Infrastructure

Introducing AOCC Optimization Report (AOR) tool that generates optimization log for loop vectorization pass for diagnostics

Others

- Optimized for AMD “Zen4” architecture
- Improved variants of scalar, vector, and loop transformations
- Support for vector and faster lib variants of AMD Math Library (AOCL-LibM)

Errata

This release includes fixes to the following critical issues and a few other known issues:

- Handling procedure pointer dummy argument in Fortran
- Fortran OpenMP multiple target creation in target parallel loops
- Fortran macro function argument substitution in fixed format mode
- Clang debuggability issue in function name generation