

Changes to the C++ standard library for C++20

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About me

I have been working on LLVM for nine years, and on libc++ for about seven, and I am the “code owner” for libc++.

I am also the chairman of the Library Working Group of the C++ Standards Committee.

I work for the C++Alliance, a US-based non-profit organization.

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Wait .. C++20 ??

After C++11, the standards committee (WG21) has set a goal to ship an updated standard every three years.

- 1 1998
- 2 2003
- 3 2011
- 4 2014
- 5 2017
- 6 2020 - scheduled
- 7 2023 - planned

Language vs Library

Most of the changes to C++ fall into one of two buckets: changes to the core language, or changes to the standard library.

Major new features frequently require changes to both at the same time.

Language and Library together

- 1 Concepts
- 2 Modules
- 3 Coroutines
- 4 Contracts
- 5 Consistent comparison
- 6 `char8_t`

New library features (1)

- 1 Ranges
- 2 Extending chrono to Calendars and Time Zones
- 3 More and More Constexpr
- 4 `std::span`
- 5 Lots of new atomic features

New library features (2)

- 1 Extending `make_shared` to Support Arrays
- 2 `[[nodiscard]]`
- 3 Integrating feature-test macros into the C++ WD
- 4 Well-behaved interpolation for numbers and pointers
- 5 Erase-Like Algorithms now return useful information
- 6 `<version>`

New library features (3)

- 1 Utility functions to implement uses-allocator construction
- 2 String Prefix and Suffix Checking
- 3 Integral power-of-2 operations
- 4 Endian just Endian
- 5 Heterogeneous lookup for unordered containers

New library features (4)

- 1 Check for Existence of an Element in Associative Containers
- 2 `shift_left` and `shift_right` algorithms
- 3 Precalculated hash values in lookup
- 4 Comparing Unordered Containers

Current status

- 1 libc++: https://libcxx.llvm.org/cxx2a_status.html
- 2 Clang: https://clang.llvm.org/cxx_status.html#cxx2a

Questions?

Thank you