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