Jacksonville, February 2016

What’s in C++17

- **The Parallelism TS, a.k.a. “Parallel STL.”**

The Parallelism TS

```
for_each( std::par,  first, last, [](auto x){ process(x); });

// explicitly sequential sort

sort(sequential, v.begin(), v.end());

// permitting parallel execution

sort(par, v.begin(), v.end());

// permitting vectorization as well

sort(par_vec, v.begin(), v.end());
```

What’s in C++17

- The Parallelism TS, a.k.a. “Parallel STL.”
- **The Library Fundamentals 1 TS**

The Library Fundamentals 1 TS

- any
- optional
- string_view
- shared_ptr for arrays
- memory pools
- search and sampling algorithms

What’s in C++17

- The Parallelism TS, a.k.a. “Parallel STL.”
- The Library Fundamentals 1 TS
- **The File System TS (based on boost.filesystem)**

The File System TS

```
namespace fs = std::experimental::filesystem;

// fail to copy directory
 fs::create_directory("sandbox/abc");
 try {
     fs::copy_file("sandbox/abc", "sandbox/def");
 } catch(fs::filesystem_error& e) {
     std::cout << "Could not copy sandbox/abc: " << e.what() << '\n';
 }
 fs::remove_all("sandbox");
```

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- The Parallelism TS, a.k.a. "Parallel STL."
- The Library Fundamentals 1 TS
- The File System TS (based on boost.filesystem)
- **The Mathematical Special Functions IS (based on boost.math)**

What's in C++17

- The Parallelism TS, a.k.a. "Parallel STL."
- The Library Fundamentals 1 TS
- The File System TS (based on boost.filesystem)
- The Mathematical Special Functions IS (based on boost.math)
- **Miscellaneous**

Miscellaneous

- Lambdas are now allowed inside constexpr functions
- Lambdas can now capture a copy of *this object by value, using the notation **[*this].**
- The range-for loop can now deal with generalized ranges where the “end” type is different from the “begin” type
- **[[fallthrough]]**, **[[nodiscard]]**, **[[maybe_unused]]** attributes
- Hexadecimal floating-point literals
- and more

Probably in C++17 during June meeting

- **if constexpr** to allow branches that are evaluated at compile time.
- **Template parameter deduction for constructors** - pair p(2, 3.5); instead of pair<int,double> p(2, 4.5)
- **Defining the order of expression evaluation**
- **operator.** (dot)
- **Defaulted comparisons**, to generate ==, !=, <, <=, >, >= for types that don't write them by hand.

Ready but not for C++17

- Concepts TS
- Transactional Memory TS
- Concurrency TS I

Not in C++17 but made into TS

- Ranges
- Networking (based on boost::asio)
- Library Fundamentals 2
- Parallelism 2
- Modules

Actively working on

- **Coroutines** - resumable functions
- **Concurrency 2**
- **2D Graphics** wrapping Cairo C API

- **Contracts** (notations, upgraded attributes works as asserts)
- **Reflection** (self-modifying programs)
- **Arrays TS - rejected**