

C++ Club UK Meeting 123

Gleb Dolgich

2021-02-25

Winter commitee meeting trip report (virtual)

- Herb Sutter
 - Reddit

WG21 mailing2021-02

- mailing2021-02
 - Reddit

Select papers

- P2317R0: C++ – an Invisible Foundation of Everything
- SG22/P2305R0: Type inference for variable definitions and function returnsproposal for C23
- SG22/P2310R0: Revise spelling of keywords for C23
- SG22/P2303R0: Function literals and value closures for C23
- P2290R0: Delimited escape sequences
- P2322R0: ranges::fold
- P2321R0: ranges::zip
- P2320R0: The Syntax of Static Reflection

```
1 meta::info r1 = ^int;  // reflects the type-id int
2 meta::info r2 = ^x;    // reflects the id-expression x
3 meta::info r2 = ^f(x); // reflects the call f(x)
```

F': A Flight-Proven, Multi-Platform, Open-Source Flight Software Framework

Fprime runs on Ingenuity Mars helicopter – [Wikipedia](#)

- [NASA on GitHub](#) – 44% C++

When to use `this` to refer to a class member?

- Reddit

Top five C/C++ things/tips/tricks you wish you had known earlier and are now used very often

- **Reddit**

Quite a few useful suggestions in the thread.

Portability: should we stop using int?

- Reddit

Build2: Complete C++20 Modules Support with GCC

- Boris Kolpackov
 - [Reddit](#)

***build2** now provides conforming and scalable support for all the major C++20 Modules features when used with GCC. This includes named modules, module partitions (both interface and implementation), header unit importation, and include translation.*

Clang support is coming soon.

Meson Build 0.57.0

- Release notes
 - [Reddit](#)
- [The Absolute Beginner's Guide to Installing and Using Meson](#)

Highlights

- Experimental support for C++ modules in Visual Studio
- **meson test** only rebuilds test dependencies
- Support added for LLVM's thinLTO

Boosting Productivity and Performance with the NVIDIA CUDA

11.2 C++ Compiler

- NVIDIA
 - Reddit

All useful stuff for machine learning is written for cuda, so everyone is forced to buy Nvidia. Been waiting for opencl pytorch backend for years, but it just seems like nobody really has a reason to do it. #

Anonymous types in C++

- Jan Bielak
 - [Reddit](#)

```
1 constexpr auto simplify(struct_(int numerator, denominator;) ratio) ->  
    decltype(ratio)  
2 {  
3     int gcd = std::gcd(ratio.numerator, ratio.denominator);  
4     return { ratio.numerator / gcd, ratio.denominator / gcd };  
5 }
```

Hot reloading C++ for rapid development with the help of **fungos/cr**

- Alex Dixon
 - fungos/cr
 - cr.h: A Simple C Hot Reload Header-only Library

Library: Conceptual

A C++20 library adapting preexisting `type_traits` into concepts, as well as improving upon the preexisting standard ones with better subsumption.

- [GitHub](#)
 - [Reddit](#)

C++ Memory Safety

- **Reddit**

Library: VirtualMultiArray

Multi graphics card based C++ virtual array implementation that uses OpenCL just for the data transfers on PCIe bridge.

- [GitHub](#)
- [Wiki](#)
- [Reddit](#)

Library: Reference Views

views (reference views) is a header-only C++17 library that allows viewing an STL container via another STL container with lvalue semantics. E.g. you could view a list as it would be a vector, or even as it would be a map, or even both.

```
1 std::list<char> data{'a', 'b', 'c'};
2 vector_view view{data};
3 std::cout << view[0] << std::endl; // a
4 std::cout << view[1] << std::endl; // b
5 std::cout << view[2] << std::endl; // c
```

- [GitHub](#)
 - [Reddit](#)
 - [See also: Vista](#)
 - [See also: Boost flat_map](#)

Library: Asio-chan

This library provides go-lang-inspired channel types to be used with ASIO awaitable coroutines. Channels allow bidirectional message passing and synchronization between coroutines.


- [GitHub](#) (C++20, MIT)
 - [Reddit](#)

Moving Faster: Everyday Efficiency in Modern C++

- C++Now 2018, YouTube
 - Reddit

C++ now


2018
MAY 7-11
cppnow.org



Alan Talbot

Moving Faster
Everyday Efficiency in
Modern C++

Video Sponsorship
Provided By:



Add – A Case Study

```
class bar {  
    vector<foo> foos;  
public:  
    template<typename... T>  
    void add(T&&... t)  
    {  
        foos.emplace_back(forward<T>(t)...);  
    }  
};  
  
bar b;  
b.add(42, 3.1415, 'Q', "Bond");
```

Why no standard library support for command line parsing?

- **Reddit**
 - P0781R0 A Modern C++ Signature for main
 - TCLAP - Templatized Command Line Argument Parser: [SourceForge](#), [GitHub](#)
 - Gflags, [GitHub](#)
 - Cxxopts
 - CLI11
 - Boost.Program_options
 - Quick Arg Parser: [GitHub](#), [Reddit](#)
 - Lyra
 - Clara, [blog post by Marius Bancila](#)

```
1 | std::vector<std::string_view> args(argv, argv+argc);
```

Number Parsing at a Gigabyte per Second

- Daniel Lemire
 - Paper
 - Reddit
 - fast_float (GitHub)
 - The Eisel-Lemire ParseNumberF64 Algorithm
 - Go Systems talk (YouTube)

std::jthread and cooperative cancellation with stop token

- [Article on Nextptr](#)
 - [Reddit](#)

Time Travel Debugging for C/C++

- Article
 - Reddit

Abbreviated Function Templates and Constrained Auto

- Sy Brand, Microsoft
 - Reddit

Library: C++20 container concepts

This library aims to provide general purpose concepts that are not available in the C++20 concepts library, most notably container concepts.

- [GitHub](#)
 - [Reddit](#)

Coderrect Scanner

A fast static analysis tool for detecting race conditions in C++ code.
Supports pthreads, `std::thread`, OpenMP, and more.

- [Home Page](#)
 - [Reddit](#)

Library: Fixed math (header-only, MIT)

- [Reddit](#)
 - [GitHub](#) (C++17, MIT)

Scientific computing in C++

- Reddit

Libraries

- Eigen
- Blaze
- Boost uBLAS
- PETSc

Documenting C++ code

- **Reddit**
 - Doxygen, Sphinx + Breathe \Rightarrow {fmt}
 - Standardese
 - clang-doc
 - hdoc
 - Adobe Hyde

CMake and the Future of C++ Package Management

- Borislav Stanimirov
 - [Reddit](#)

Motivating examples of coroutines

- Reddit
- Previously: Reddit

The perils of the accidental C++ conversion constructor

- Raymond Chen
 - Reddit

No one hates C++ more than the people who love C++. #

Making Win32 APIs More Accessible to More Languages

- Microsoft
 - C++/WinRT

C++ and game engines

- Reddit

Hey, I started out with C++ 3 months ago and really love it. I already have some experience in Unity, but I'd like to use C++. Is there any engine you would recommend me to try out? I know about Unreal Engine but I can't find any good tutorials for how to use C++ with Unreal Engine. Is there any other option or a tutorial series or anything you could recommend me?

Game developers, what compiler optimization setting do you use?

- Reddit

EnTT 3.6.0

Gaming meets modern C++ - a fast and reliable entity component system (ECS) and much more.

- [Announcement on Reddit](#)
 - [GitHub](#) (C++17, MIT)

Better CMake

- Videos by Jefferson Amstutz

Solving differential equations with LLVM

Heyoka is a C++ library for the integration of ordinary differential equations (ODEs) via Taylor's method. Notable features include:

- support for both double-precision and extended-precision floating-point types (80-bit and 28-bit),
- the ability to maintain machine precision accuracy over tens of billions of timesteps, batch mode integration to harness the power of modern SIMD instruction sets,
- a high-performance implementation of Taylor's method based on automatic differentiation techniques and aggressive just-in-time compilation via LLVM.

Links

- [GitHub](#) (C++17, MPL-2.0)
 - [Docs](#)
 - [Reddit](#)

TTauri: modern retained-mode GUI library in C++20

- GitHub
 - Reddit

C++20 Coroutines: sketching a minimal async framework

- Jeremy Ong
 - Reddit

C++ Performance Trap #1: Constant-size `std::vector`

- Scott Wolchok
 - [Reddit](#)
 - [Software optimization resources, by Agner](#)

C++ Performance Trap #2: Unnecessary std::function

- Scott Wolchok
 - Reddit

Inlining and Compiler Optimizations

- Scott Wolchok
 - Reddit

Library: Cli

A cross-platform header only C++14 library for interactive command line interfaces (Cisco style).

- [GitHub](#)



Catalin Pit
@catalinmpit

Developers: My back hurts. My whole body aches.

Also developers when they work:

