

C++ Club Meeting 100

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2020-02-27

- Bryce Lebach et al.
 - 252 attendees! 23 subgroups! 9 tracks!
 - **C++20** is done!
 - **C++23** roadmap! **Standard library modules; library support for coroutines; executors; networking**. Also: reflection; pattern matching; contracts.
- Herb Sutter
 - [Reddit](#)
- CppCast with Hana Dusíková
 - [YouTube](#)

- [Video](#)
- [Reddit](#)

- Reddit

Comment:

I work in a large codebase that was originally written in C and was compiled with C++03 just a few years ago. Since then, we have upgraded through C++11, C++14 and are now using C++17. So far, my experience is that every upgrade has been almost exclusively a positive experience, and each version has made it easier to write safe and expressive code.

Concepts pushed to Clang master



Saar Raz

@saarraz1



#clang #concepts #trunk.

```
03:09:53 projects > cd /Users/saarraz/llvm-project & clang git push trunk master
Enumerating objects: 48, done.
Counting objects: 100% (48/48), done.
Delta compression using up to 8 threads
Compressing objects: 100% (24/24), done.
Writing objects: 100% (25/25), 4.10 KiB | 2.05 MiB/s, done.
Total 25 (delta 23), reused 1 (delta 1)
remote: Resolving deltas: 100% (23/23), completed with 23 local objects
To github.com:llvm/llvm-project.git
 a156da5fb36..b933d37cd37 master -> master
```

2:31 AM · Jan 22, 2020 · [Twitter for Android](#)

- [Reddit](#)

[C++ coroutines] Initial implementation pushed to GCC master

- Message
- Reddit

*This is not enabled by default (even for **-std=c++2a**), it needs **-fcoroutines***

- [Audio](#)
- [Video](#)

There's a misunderstanding (of contracts in the C++ committee – GD) that's not easy to appreciate if you're not a real day-to-day software engineer. That is what derailed contracts. I will fix it. I promise you, I will fix it.

Follow-up: Aggregates

From [CppReference](#): An aggregate is one of the following types:

- array type
- class type (typically, struct or union), that has
 - no private or protected *direct* (since C++17) non-static data members
 - no *user-declared constructors* (until C++11)
 - no *user-provided constructors* (explicitly defaulted or deleted constructors are allowed) (since C++11) (until C++17)
 - no *user-provided, inherited, or explicit constructors* (explicitly defaulted or deleted constructors are allowed) (since C++17) (until C++20)
 - no *user-declared or inherited constructors* (since C++20)
 - no virtual, private, or *protected* (since C++17) base classes
 - no virtual member functions
 - no *default member initializers* (since C++11) (until C++14)

- Raymond Chen: How can I handle both structured exceptions and C++ exceptions potentially coming from the same source?
 - [Reddit](#)
- Raymond Chen: Can I throw a C++ exception from a structured exception?

“Making new friends” idiom by Dan Saks

Wikibooks

The goal is to simplify creation of friend functions for a class template.

```
1 template<typename T>
2 class Foo {
3     T value;
4 public:
5     Foo(const T& t) { value = t; }
6     friend ostream& operator <<(ostream& os, const Foo<T>& b)
7     {
8         return os << b.value;
9     }
10 };
```

A new decade, a new tool: libman

- Colby Pike (vector-of-bool)
- Reddit
- GitHub
- Specification

libman is a new level of indirection between package management and build systems.

dds is Drop-Dead Simple build and package manager.

- CppCon 2019: Robert Schumacher “How to Herd 1,000 Libraries”

- Article

A hidden gem: inner_product (2/2)



Conor Hoekstra @code_report

@cjdb_ns & @TartanLlama

4

This makes me so incredibly happy! I literally just yesterday googled, C++17 / C++20 zip to see if they had anything, because I wrote some code in both C++ and #Python and Python was so much more beautiful.

```
int solve(int h, vector<int> w, vector<int> l) {  
    int p = 0;  
    for (int i = 0; i < w.size(); ++i)  
        p = max(p, w[i] - l[i] / 4);  
    return max(0, p - h);  
}  
  
def solve(h, w, l):  
    p = max(a - b/4 for a, b in zip(w, l))  
    return max(0, p - h)
```

29w • 03/12/2018 • 17:47



Conor Hoekstra @code_report

@cjdb_ns & @TartanLlama

Also, I just discovered std::inner_product – a beautiful temporary solution to a lack of zip.
#cpp #inner_product

```
int solve(int h, vector<int> w, vector<int> l) {  
    return max(0, inner_product(begin(w), end(w), begin(l), 0,  
        [](auto a, auto b) { return max(a, b); },  
        [](auto a, auto b) { return a - b / 4; }) - h);  
}
```

27w • 16/12/2018 • 09:30



- Article



Shafik Yaghmour @shafikyaghmour

Rereading "The Design and Evolution of C++"

= 0

syntax was used for pure virtual function in order to avoid having to add a new keyword such as pure or abstract because the feature was added close to the next release.

Twitter: Pure virtual function syntax (2/2)

13.2.3 Syntax

The curious `=0` syntax was chosen over the obvious alternative of introducing a keyword `pure` or `abstract` because at the time I saw no chance of getting a new keyword accepted. Had I suggested `pure`, Release 2.0 would have shipped without abstract classes. Given a choice between a nicer syntax and abstract classes, I chose abstract classes. Rather than risking delay and incurring the certain fights over `pure`, I used the traditional C and C++ convention of using 0 to represent “not there.” The `=0` syntax fits with my view that a function body is the initializer for a function and also with the (simplistic, but usually adequate) view of the set of virtual functions being implemented as a vector of function pointers (§3.5.1). In fact, `=0` is not best implemented by putting a 0 in the `vtbl`. My implementation places a pointer to a function called `__pure_virtual_called` in the `vtbl`; this function can then be defined to give a reasonable run-time error.

I chose a mechanism for specifying individual functions `pure` rather than a way of declaring a complete class `abstract` because the pure virtual function notion is more flexible. I value the ability to define a class in stages; that is, I find it useful to define some virtual functions and leave the definition of the rest to further derived classes.

- Herb Sutter

The state of a after it has been moved from is the same as the state of a after any other non-const operation. Move is just another non-constfunction that might (or might not) change the value of the source object.

- Daniel Martin

A header-only, tiny and easy to use library for game programming and much more written in modern C++, mainly known for its innovative entity-component-system (ECS) model.

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

Favourite “You can do that in C++?! Neat!” moments

Reddit

Oscar Godson:

One of the best programming skills you can have is knowing when to walk away for a while.

Rust is better than C++20, by David Sankel

David Sankel, “We Have C++20” bloopers:

(C++) is like Rust, but worse.

Operator:

What's better about Rust?

David Sankel:

I don't know, I haven't actually used Rust.