CppCon2017 Trip Report

Timothy C. Wright

Overview

- Pre and Post conference tutorials

  - Extra Fee

- Conference

  - Monday to Friday

  - Approximately 8 am (open content) to 10 pm every night.

Good Advice

- http://www.gregcons.com/KateBlog/ SurvivingAnIntenseConference.aspx

Expensive

- Travel

  - Always in Bellevue, Washington

- Pre and Post Tutorials

  - Approximately $435 a day

- Conference

  - $900

- Hotels

  - $200 to $300 dollars a night

- Food

How to go on the cheap

- Be a presenter

  - Conference is free

- Submit a Poster with a C++ topic

  - Accepted submitter gets conference fees refunded

- Volunteer

  - Half the time you work, half the time is yours

  - Conference is free

  - Pre and Post tutorial fees are reduced.

- Find a room mate, the hotels are expensive

Socialization

- Meeting and talking to other C++ programmers is the prime reason to go

- Some activities to meet people

  - Volunteer Dinner Saturday

  - T-Shirt Dinner on Sunday

  - Registration/Reception

  - Meeting people for lunch/dinner

  - Boost Community Dinner/ Speaker Dinner

Socialization

- Recommendation: just join a conversation

- Challenge to remember names and faces

- Badge quote

Logistics

- Conference held at a Conference Center

- All hotels are near the center 5 - 15 minute walk

  - My hotel was the cheapest so a 15 minute walk

- Downtown Bellevue, a suburb of Seattle

- Very easy to walk to lunch/dinner

- Grocery stores nearby

Booths

- Company Booths

  - Undo

  - JFrog

  - Microsoft

  - JetBrains

  - A few others

- Bookstore

  - Expensive side

Content

- 6 or 7 talks concurrently

  - Can't see them all

- Luckily they are posted on line

- I will highlight some talks I attended

Template Programming

Steve Dewhurst

- Two day tutorial

- C++ is a complex language

- Programming in C++ follows accepted idioms

- With the new standards C++14 and C++ 17, the accepted idioms have not been finalized

Template Programming

Steve Dewhurst

```cpp
template <typename T>
struct MyTupleImpl
{
    T value;
};


template <typename... Ts>
struct MyTuple : MyTupleImpl<Ts>...
{
};

MyTuple<> t;
MyTuple<int, float> t2;
MyTuple<int, int, float> t3; // can't have duplicate types
```
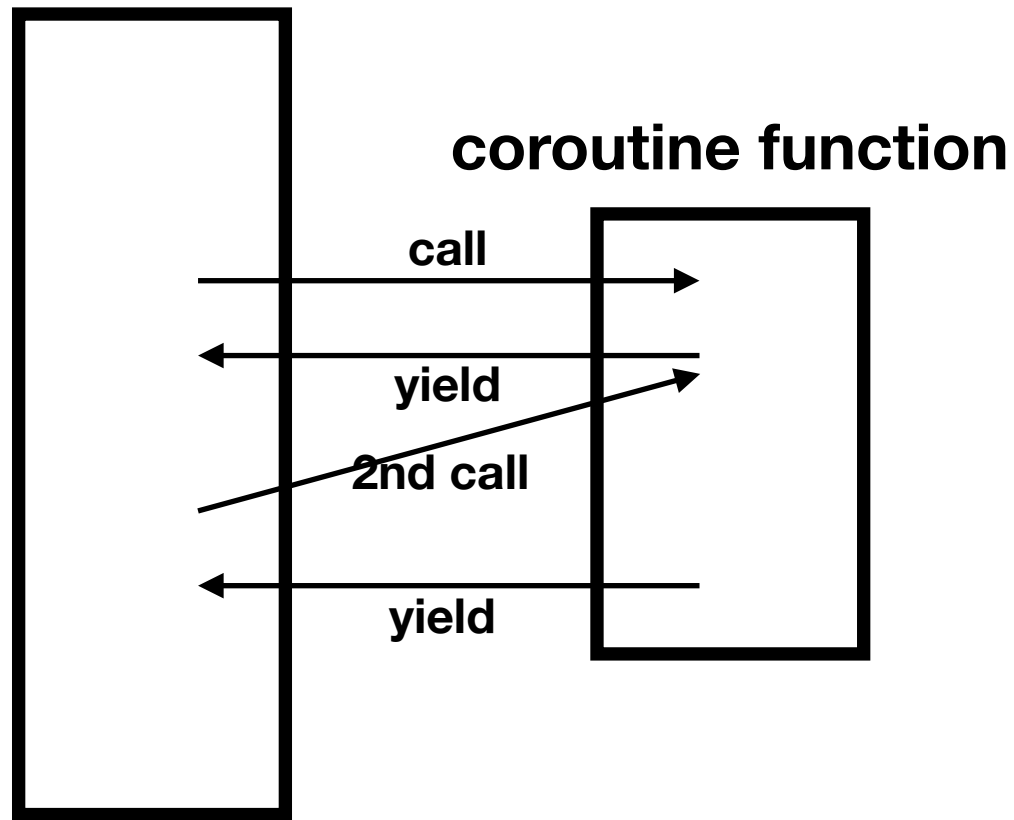
Coroutines: What can't they do?

Toby Allsopp

Calling Context

coroutine function

call

yield

2nd call

yield

Uses:

Generators
async

composing functions
returning optional

type erased callable

Unicode Strings

Barbara Geller & Ansel Sermersheim

- Many languages like C# implement UTF-16 but contains issues

- The web uses UTF-8 and is easier to implement

- Provided a BSD licensed CsString, can handle UTF-8 or UTF-16.

New and Upcoming VS2017

Steve Carroll & Daniel Moth

- Maybe in Visual Studio 2017 15.6 be standard compliant?

- 15.5 Preview 2 was just released.

Esoteric Data Structures

Allan Deutsch

Bloom Filter

- Answer the question: is an element a member of a set?

  - Does not have the value, just returns yes or no

- Always no

- Sometimes a false positive

- very fast and small

Fuzz or Lose

Kostya Serebryany

- Testing by random input data

- libfuzz library use with Clang

- Structure-aware fuzzing

- OSS-Fuzz project to fuzz open source projects like Boost

vcpkg
Eric Mittelette, Robert Schumacher

- Open Content Talk, not recorded.

- Source based open source package management for Windows/Visual Studio

- Still not sure the benefits and drawbacks of vcpkg compared to conan.io

- Open source, works well

Everything about DLL

JAMES MCNELLIS

- Different ways to export functions/variables and classes from DLLs

- How DLLs are found

- DLLs are reference counted. If you load the same DLL twice, then it must be unloaded twice.

C++ as a "Live as Head" language

Titus Winters

- Released Google open source C++ library Abseil

- Versioning with a number system is problematic

- No versions, work always from Head

- Responsibility of the library developers to provide conversion tools if API changes.

- Promise 5 year support

- Discussed recently on CppCast

MPark.Patterns Pattern Matching in C++

Michael Park

- In a functional language, you can create a case statement switching on types and values.

- MPark explored how to do this in C++ as a library implementation

- Determine if a library implementation is enough or will library support be required.

Using Functional Programming Patterns to build HTTP routing API

Quentin Duval, Jeremy Demeule

- Creating a HTTP routing api in C++

- Showed how it can be complex and hard to manage in C++

- How functional style helps clean it up

Agent based class design

Odin Holmes

- Policy Based Design is not flexible enough

- Proposed a Agent based design still in progress

  - Variations on shared_pointer

    - Currently everyone pays for atomic reference counting

    - What if you are not in a multithreaded environment?

  - Handle configuration of hardware like:
    UART
    baud rate
    tx pin
    rcvr pin
    etc

The spaceship operator
Walter Brown

Have the compiler generate all the comparison operators for you. You specify the ordering.

```
class Point
{
  int x; int y;
  public: friend std::strong_ordering operator<=>(const Point&, const Point&) = default;
// ... other functions, but no other user-declared comparisons ...
};
```

- http://open-std.org/JTC1/SC22/WG21/docs/papers/2017/p0515r0.pdf

10 Core Guidelines
Kate Gregory

- The C++ core guidelines are getting big. How to pick and choose which to support?

Meta: Thoughts on generative C++

Herb Sutter

- Must see the talk

- Too bad that this is probably C++23 or later.

C++ Community Building Birds of a Feather

- 50% or more of our speakers come from our members

- Encourage members to give talks

- Ask well known speakers to give a talk, especially if they will be in the area

- Advertise the meeting by the first of the month so it is published by Jan Weller (Meeting C++)

Designing Fast, Efficient Hash Table

Matt Kulukundis

- Google cares that maybe 5% of RAM is used by all the hash tables. They want a smaller footprint.

- Went to great lengths to optimize

Optimizing code speed and space with build time switches

Panel

- gcc -01 does nothing

- inline hints are ignored

A History of Qt

Lars Knoll

- It did not discuss the library conflict between Qt libraries and the C++ standard.

What has my compiler done for me?

Matt Godbolt

- https://godbolt.org/

- Online compiler to show the generated assembly

- Talk shows how smart the compilers are

- Supports many languages including Haskell

- More Features coming

Summary

- Learned a lot

- Talked to people

- Hope to go next year