

LOW LATENCY C++

C++ ON SEA 2019

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ABOUT DAVID

- △ Automated Trading Team Lead at Optiver
- △ 15+ years of programming, mostly C++ and Python
- △ Teaching “C++ engineering 101”
- △ Hobbies: C++, climbing, yoga
- △ GitHub: <https://github.com/david-grs>



ABOUT WALTHER

- △ MSc Applied Physics
- △ 30+ years of programming
- △ 20+ years of C++
- △ 5+ years at Optiver
- △ Hobbies: C++, volleyball, piano playing
- △ GitHub: <https://github.com/wahez>

ABOUT OPTIVER

- △ A market maker: always on the market to provide prices
- △ Calculates the correct price
- △ Faster than the competition...
 - △ Low latency C++
 - △ It's not about throughput, it's about time!

optiver△

ABOUT OPTIVER

△ Amsterdam, Sydney, Chicago, Shanghai, London

△ Founded in 1986

△ 440 people in Amsterdam

△ 45 nationalities

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OUR PLAN TODAY

C++ ON SEA 2019



SCHEDULE

▲ 9.00 – Introduction

▲ 10.00 – *Break*

▲ 10.15 – CPU, Memory and benchmarking

▲ 12.15 – *Lunch*

▲ 13.00 – 4 steps of optimization

▲ 14.30 – *Break*

▲ 14.45 – Live coding: the latency game

▲ 16.15 – *Break*

▲ 16.30 – Low latency C++ ecosystem

▲ 18.00 – *End*

WHAT WE WILL DO

- △ Theory and hands-on coding
- △ Linux and x86 centric
- △ Environment
 - △ Amazon Web Services (AWS)
 - △ Ubuntu 18.04 LTS
 - △ g++-7
 - △ Git

GOLDEN RULES

- △ Measure
- △ Tune what matters
- △ Do not optimize prematurely
- △ Know your problem
- △ Understand your code
- △ Know your hardware
- △ ... there is no silver bullet!