Modern C++ - Why and What

JLM Charedi Tech Meetup

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Thunderbolt^{TM} SW team, Intel

Agenda

- Modern C++ - Meaning

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    - To make sure we use the same terminology

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  - “Not your father’s C++”
    - (Herb Sutter’s title for a presentation in Lang.NEXT 2012)

Outline

Part I

Modern C++ - Meaning

Outline

1. What it means "Modern C++"?
   - New standards
   - Not just the standards

Slow start. . .

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- `http://en.cppreference.com/w/cpp/language/history`

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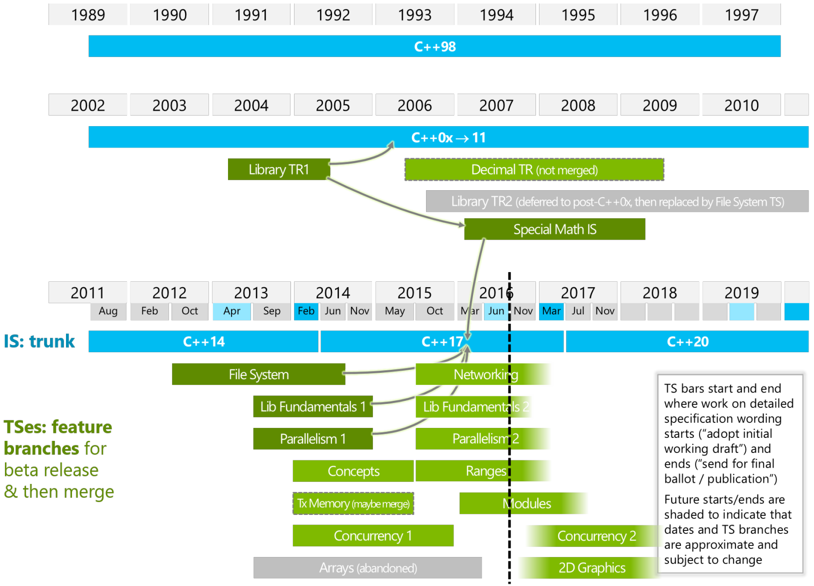
- Tool support
  - IDEs, static and dynamic analyzers, etc.

Perspective



TS bars start and end where work on detailed specification wording starts ("adopt initial working draft") and ends ("send for final ballot / publication")

Future starts/ends are shaded to indicate that dates and TS branches are approximate and subject to change

https://herbsutter.com/2016/06/30/trip-report-summer-iso-c-standards-meeting-oulu/

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Not only 'what', it's also about the 'how'

- C++ Core Guidelines

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- More...
- Generally: the common wisdom the C++ developer community collected over the years

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Part II

Modern C++ - Why?

Outline

2 Wasn't C++ dead years ago?

3 Aren't managed languages all what we need?

The Free Lunch Is Over

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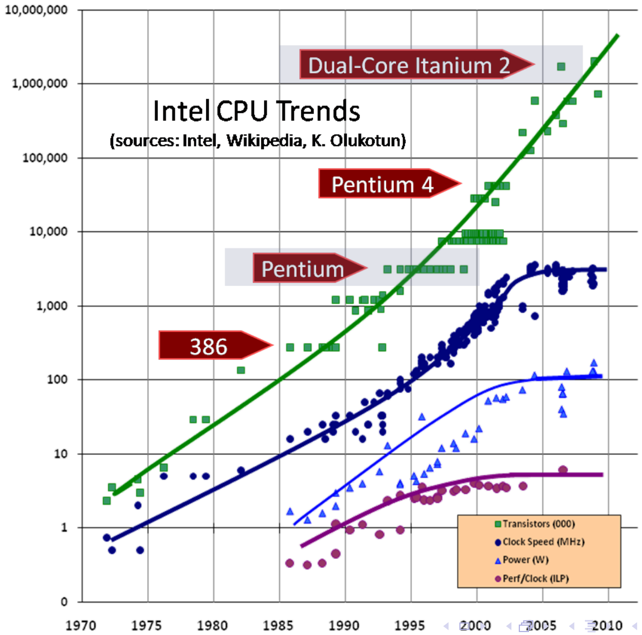
- Key observation was simply looking at the following graph:

CPU graph



Intel CPU Trends
(sources: Intel, Wikipedia, K. Olukotun)
Dual-Core Itanium 2
Pentium 4
Pentium
386
10,000,000
1,000,000
100,000
10,000
1,000
100
10
1
0
1970
1975
1980
1985
1990
1995
2000
2005
2010
■ Transistors (000)
● Clock Speed (MHz)
▲ Power (W)
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    - Do more with the same for better experience

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- What it means Managed / Unmanaged?

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Part III

Modern C++ - What?

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  - Implicit conversions

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- Sometimes they also improve performance (but in no case hurt performance)

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```
std::map<std::string, int> m;

// Fill with data ...

for (auto i = m.begin(); i != m.end(); ++i)

{

    const std::pair<std::string, int>& entry = *i;

    // Work with entry

}
```

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- (We'll see it in use in the following code examples)

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- Further expanded by structured binding in C++17

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Part IV

Summary

Summary

- We discussed:

Summary

- We discussed:
    - Why

Summary

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  - Why
  - (A bit of) What

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Part V

References

References

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