

WG21 2021-10 Virtual Meeting Minutes of Meeting

ISO/IEC JTC1 SC22 WG21 N4898 — 2021-10-18

Nina Dinka Ranns, dinka.ranns@gmail.com

Chair: John Spicer

Monday 2021-10-04

08:00 N.Am. Pacific Time

1. Opening activities

John Spicer opens the meeting at 08:03 AM N.Am. Pacific Time

1.1 Opening comments (PL22.16)

John Spicer presents.

1.2 Meeting guidelines

John Spicer presents.

Meetings are not public, but are open to visitors. Please refrain from live tweeting, blogging, taking photos or videos.

Every participant is responsible for understanding and abiding by the following:

[The INCITS Antitrust Guidelines \(PL22.16\)](#)

[The INCITS Patent Policy \(PL22.16\)](#)

[The ISO Code of Conduct](#)

[The INCITS Code of Conduct \(PL22.16\)](#)

[The IEC Code of Conduct](#)

[The WG21 Practices and Procedures, and Code of Conduct](#)

If you have any questions or concerns about CoC issues, please approach a committee officer or a NB representative and bring it to their attention. If you have any technical issues or concerns, please bring them up as soon as possible.

1.3 The ISO Code of Conduct

John Spicer presents CoC principles.

1.4 Membership, voting rights, and procedures for the meeting (PL22.16)

John Spicer presents voting rights.

If you are representing an organization that is considering formally joining PL22.16, or your organization is already a member and you wish to change your voting status, please inform an officer.

Hal Finkel presents. When registering for the call, please make sure you use the name that is registered in the global directory.

John Spicer presents how to vote using the telecon client.

If you are not an INCITS voting member, please do not move any of the PL22.16 motions.

1.5 Introductions

New members introduce themselves.

John Spicer welcomes new members.

1.6 Agenda review and approval (PL22.16 motion, WG21 poll)

John Spicer presents the agenda.

The meeting goals described above are derived from the schedule adopted in 2020 and described in: [P1000R4](#).

The primary goals of this meeting will be to provide any necessary status updates and conduct straw polls proposed for working draft changes.

PL22/16 motion to approve the meeting agenda

Bryce Adelstein Lelbach moves

Daveed Vandevoorde seconds.

The motion is unanimously approved by PL22/16.

WG21 motion to approve the meeting agenda.

The motion is unanimously approved by WG21.

1.7 Editor's reports, approval of working drafts

| Document | Editor's report | Prospective WD |
|----------------|-----------------------|-----------------------|
| C++23 Standard | N4893 | N4892 |

WG21 motion to approve the working drafts.
The motion is unanimously approved by WG21.

1.8 Approval of the minutes of the previous meetings (PL22.16 motion, WG21 poll)

| Meeting | Minutes |
|--|------------------------------------|
| WG21 February Virtual | N4891 |
| PL22.16 February Virtual | pl22.16-2021-00011 |
| WG21 pre-June Virtual administrative telecon | N4897 |

PL22/16 motion to approve the minutes.
Bryce Adelstein Lelbach moves.
Daveed Vandevoorde seconds.
The motion is unanimously approved by PL22/16.

WG21 motion to approve the minutes.
The motion is unanimously approved by WG21.

2. Liaison reports, and WG21 study group reports (see pre-meeting WG21 telecon minutes)

No discussion.

3. WG progress reports (Core, Evolution, Library, Library Evolution; see pre-meeting WG21 telecon minutes)

No discussion.

4. New business requiring action by the committee

No discussion.

5. Discussion and Straw Polls

WG and SG status and progress reports should be mailed to meeting@ no later than 7 days before the start of the meeting.

Plenary straw polls must be posted on the meeting wiki Straw Polls no later than 7 days before the start of the meeting.

Presentation and discussion of proposals to be considered for consensus adoption by full WG21.

5.1 CWG Polls

Jens Maurer presents.

There are changes for the straw polls since the admin meeting. We are excluding issue 1726 from the first motion because it needs additional work.

In the admin meeting we noted that there are reviews of two papers ongoing. The reviews are complete and are on the straw poll list - P2036 and P2314.

1. Accept as Defect Reports all issues except issue 1726 in P2462R0 (Core Language Working Group "ready" Issues for the October, 2021 meeting) and apply the proposed resolutions to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

2. Apply the changes in P2242R3 (Non-literal variables (and labels and gotos) in constexpr functions) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

3. Apply the changes in P0847R7 (Deducing this) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

4. Apply the changes in P2316R2 (Consistent character literal encoding) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

5. Apply the changes in P2334R1 (Add support for preprocessing directives `elifdef` and `elifndef`) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

6. Apply the changes in P2246R1 (Character encoding of diagnostic text) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

7. Apply the changes in P2360R0 (Extend `init-statement` to allow `alias-declaration`) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

8. Accept P2036R3 (Change scope of lambda trailing-return-type) as a Defect Report and apply the changes therein to the C++ working paper.

Jens Maurer: this is one of the motions that has been added after the admin telecon.

Herb Sutter : was this on the polls page one week before today ?

Hubert Tong : yes, it was.

No objection to unanimous consent.

Motion passes.

9. Apply the changes in P2128R6 (Multidimensional subscript operator) to the C++ working paper.

Discussion.

There are objections in the room.

Herb Sutter reminds of the voting rules.

In favour : 44

Opposed : 2

Abstain : 19

There is consensus.

Motion passes.

10. Apply the changes in P2314R4 (Character sets and encodings) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

11. Direct the convener to request a New Work Item for a Technical Specification on "C++ Extensions for Minimal Transactional Memory" with P2066R10 (Suggested draft TS for C++ Extensions for Minimal Transactional Memory) as its initial content and Michael Wong as project editor and, if the New Work Item is approved, to publish the result for a DTS ballot.

Discussion.

No objection to unanimous consent.

Motion passes.

5.2 LWG Polls

Jonathan Wakely presents. There were new items approved since the admin telecon. We have 39 issues and 18 motions. Everything has been on the poll page for over a week.

Issues

1. Apply the changes for all Tentatively Ready issues in P2450R0 (C++ Standard Library Issues to be moved in Virtual Plenary, Oct. 2021) to the C++ working paper.

No objection to unanimous consent.

Motion passes.

C++20 and C++23

2. Apply the changes in P2372R3 (Fixing locale handling in chrono formatters) to the C++ working paper, as a Defect Report for C++20.

No objection to unanimous consent.

Motion passes.

3. Apply the changes in P2415R2 (What is a view?) to the C++ working paper, as a Defect Report for C++20.

Objections in the room.

In favour : 39

Opposed : 3

Abstain : 22

There is consensus.

Motion passes.

4. Apply the changes in P2418R2 (Add support for `std::generator` -like types to `std::format`) to the C++ working paper, as a Defect Report for C++20.

No objection to unanimous consent.

Motion passes.

5. Apply the changes in P2432R1 (fix `istream_view`) to the C++ working paper, as a Defect Report for C++20.

Objections in the room.

In favour : 32

Opposed : 1

Abstain : 28

There is consensus.

Motion passes.

C++23

6. Apply the changes in P0288R9 (`move_only_function`) to the C++ working paper.

No objection to unanimous consent.

Motion passes.

7. Apply the changes in P0798R8 (Monadic operations for `std::optional`) to the C++ working paper.

No objection to unanimous consent.

Motion passes.

8. Apply the changes in P0849R8 (`auto(x)`: decay-copy in the language) to the C++ working paper.

No objection to unanimous consent.

Motion passes.

9. Apply the changes in P1072R10 (basic_string::resize_and_overwrite) to the C++ working paper.

Objections in the room.

In favour : 31

Opposed : 1

Abstain : 32

There is consensus.

Motion passes.

10. Apply the changes in P1147R1 (Printing volatile Pointers) to the C++ working paper.

No objection to unanimous consent.

Motion passes.

11. Apply the changes in P1272R4 (Byteswapping for fun&&nuf) to the C++ working paper.

No objection to unanimous consent.

Motion passes.

12. Apply the changes in P1675R2 (rethrow_exception must be allowed to copy) to the C++ working paper.

No objection to unanimous consent.

Motion passes.

13. Apply the changes in P2077R3 (Heterogeneous erasure overloads for associative containers) to the C++ working paper.

Objections in the room.

In favour : 35

Opposed : 0

Abstain : 26

There is consensus.

Motion passes.

14. Apply the changes in P2251R1 (Require span & basic_string_view to be Trivially Copyable) to the C++ working paper.

No objection to unanimous consent.

Motion passes.

15. Apply the changes in P2301R1 (Add a pmr alias for std::stacktrace) to the C++ working paper.

Objections in the room.

In favour : 30

Opposed : 0

Abstain : 27

There is consensus.

Motion passes.

16. Apply the changes in P2321R2 (zip) to the C++ working paper.

No objection to unanimous consent.

Motion passes.

17. Apply the changes in P2340R1 (Clarifying the status of the "C headers") to the C++

working paper.

No objection to unanimous consent.

Motion passes.

18. Apply the changes in P2393R1 (Cleaning up integer-class types) to the C++ working paper.

No objection to unanimous consent.

Motion passes.

19. Apply the changes in P2401R0 (Add a conditional noexcept specification to std::exchange) to the C++ working paper.

No objection to unanimous consent.

Motion passes.

6. Closing activities

6.1 Other business

No discussion

6.2 PL2.16 motions, if any

PL22.16 business.

7 Plans for the future (PL22.16)

7.1 Next and following meetings

Herb Sutter presents.

2022-02-07: Winter Virtual

2022-07-25 to 30 New York, NY, USA (tentative)

2022-11-07 to 12: Kona, HI, USA: Standard C++ Foundation, Plum Hall, Jens Maurer

7.2 Mailings

Note: These are the closest regular mailings and not special pre/post meeting mailings.

2021-10-15: Post-Autumn

2022-01-15: Pre-Winter

8. Adjournment (PL22.16 motion)

Bryce Adelstein Leibach moves.

Daveed Vandevorde seconds.

John Spicer adjourns the meeting at 09:38 AM N.Am. Pacific Time

9. Attendance

| Name | Country | Organization |
|-------------------|----------------|----------------------------|
| Aaron Ballman | USA | Intel Corporation |
| Alex Voicu | USA | AMD |
| Alisdair Meredith | USA | Bloomberg |
| Andreas Weis | Germany | |
| Antony Polukhin | Russia | |
| Barry Hedquist | USA | Perennial |
| Barry Revzin | USA | Jump Trading LLC |
| Bill Seymour | USA | Seymour |
| Billy Baker | USA | FlightSafety International |
| Bob Steagall | USA | KEWB Computing |
| Bronek Kozicki | United Kingdom | |

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|-------------------------|----------------|---------------------------------------|
| Bryan St Amour | Canada | |
| Bryce Adelstein Lelbach | USA | NVIDIA Corporation |
| Michael Wong | Canada | |
| Christian Trott | USA | Sandia National Laboratories |
| Christof Meerwald | Austria | |
| Christopher Di Bella | United Kingdom | |
| Chuanqi Xu | China | |
| Colin MacLean | USA | Lawrence Berkeley National Laboratory |
| Corentin Jabot | France | |
| Damien Lebrun-Grandie | USA | Oak Ridge National Laboratory |
| Dan Raviv | | |
| Daniela Engert | | |
| Daveed Vandevorode | USA | Edison Design Group |
| David Sankel | USA | Bloomberg |
| David Tenty | Canada | |
| David Vitek | USA | GammaTech Inc |
| Davis Herring | USA | Los Alamos National Laboratory |
| Detlef Vollmann | Switzerland | |
| Dietmar Kühl | USA | Bloomberg |
| Dounia Khaldi | USA | Intel Corporation |
| Erich Keane | USA | Intel Corporation |
| Fabio Fracassi | Germany | |
| Florian Sattler | | |
| Frank Birbacher | United Kingdom | |
| Gabriel Dos Reis | France | Microsoft Corporation |
| Gary Klimowicz | USA | Dancing Bear Software LLC |

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|---------------------|----------------|------------------------------|
| Gašper Ažman | United Kingdom | |
| Glen Fernandes | USA | The C Plus Plus Alliance Inc |
| Graham Lopez | USA | NVidia Corporation |
| Guy Davidson | United Kingdom | |
| Hal Finkel | USA | United States Dept of Energy |
| Hana Dusíková | Czech Republic | |
| Hans Boehm | USA | Google |
| Herb Sutter | USA | Microsoft Corporation |
| Howard Hinnant | USA | Ripple Labs |
| Hubert Tong | Canada | IBM Corporation |
| Inbal Levi | Israel | |
| Izzy Muerte | | |
| Jayesh Badwaik | | |
| Jean-Paul Rigault | France | |
| JeanHeyd Meneide | Netherlands | |
| Jens Maurer | USA | Edison Design Group |
| JF Bastien | Canada | |
| John Lakos | USA | Bloomberg |
| John Spicer | USA | Edison Design Group |
| Jonathan Wakely | United Kingdom | IBM Corporation |
| Joshua Berne | | |
| Juan Alday | USA | GreenWireSoft |
| Kelly Walker | USA | Stellar Science |
| Larry Lewis | USA | SAS Institute Inc |
| Lars Gullik Bjønnes | USA | Cisco Systems Inc |
| Lee Howes | USA | Facebook |

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|------------------------------|-------------------|-----------------------------|
| Louis Dionne | USA | Apple |
| Mark Hoemmen | USA | Stellar Science |
| Mark Zeren | USA | VMware Inc |
| Matthew Butler | USA | Laurel Lye |
| Matthias Kretz | Germany | |
| Matus Chochlik | Slovakia | |
| Michael Adams | Canada | |
| Michael Hava | Austria | |
| Michael Spencer | USA | Apple |
| Michał Dominiak | Poland | NVIDIA Corporation |
| Mingxin Wang | | |
| Nathan Sidwell | United Kingdom | |
| Nemanja Boric | USA | Amazon Corporate LLC |
| Nevin Liber | USA | Argonne National Laboratory |
| Nicolai Josuttis | Germany | |
| Nina Ranns | United Kingdom | Edison Design Group |
| Pablo Halpern | USA | Halpern-Wight Inc |
| Patrice Roy | Canada | |
| Peter Brett | United Kingdom | |
| Peter Kulczycki | Austria | |
| Phil Nash | United Kingdom | |
| Phil Ratzloff | USA | SAS Institute Inc |
| René Ferdinand Rivera Morell | | |
| Richard Corden | USA | Programming Research Ltd |
| Rob Douglas | Aquatic Group LLC | |
| Robert Leahy | Canada | |

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|-------------------|----------------|--|
| Robert Simpson | USA | Qualcomm Inc |
| Roger Orr | United Kingdom | |
| Ruslan Arutyunyan | USA | Intel Corporation |
| Ryan McDougall | | |
| Bill Ash | USA | INCITS Secretariat |
| Scott Schurr | USA | Ripple Labs |
| Sebastian Büttner | | |
| Steve Downey | | |
| Thomas Köppe | USA | Google |
| Tim Song | USA | Jump Trading LLC |
| Timur Doumler | United Kingdom | |
| Tom Honermann | USA | Synopsys Inc |
| Tom Scogland | USA | Lawrence Livermore National Laboratory |
| Tomasz Kamiński | | |
| Victor Zverovich | | |
| Ville Voutilainen | Finland | The Qt Company |
| Walter E Brown | USA | Brown |
| Wesley Maness | USA | Schonfeld Tools LLC |
| Wyatt Childers | USA | Edison Design Group |