

WG21 2022-02 Virtual Meeting

Record of Discussion

ISO/IEC JTC1 SC22 WG21 P2557 — 2022-02-07

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Chair: John Spicer

Monday 2021-02-07

08:00 N.Am. Pacific Time

1. Opening activities

John Spicer opens the meeting at 08:04 AM N.Am. Pacific Time

1.1 Opening comments (PL22.16)

John Spicer presents.

Thank you for all the work that has been done in our virtual environment. People have made the best of the circumstance, and for some things, this environment works better. It's a helpful tool that can be used even when we can meet face to face.

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. Motions have been posted on the straw polls page before the meeting together with any new documents. Old documents can be found in the earlier mailings. Everyone is expected to be familiar with the motions and the documents they refer to before coming to the meeting. This is important because we want to address any issues before this meeting.

1.3 The ISO Code of Conduct

John Spicer presents CoC principles.

Herb Sutter : As mentioned in the pre-meeting telecon, you may have noticed more than usual rants about WG21-related frustrations on social media such as Twitter and Reddit comments. This is just a reminder that our CoC includes not just meetings and mailing lists, but also interactions between WG21 participants anywhere (even private email) when it's about WG21. The ISO and IEC CoCs specifically say they include social media, and that we must be professional and respectful there. And, generally, that we support the ISO dispute resolution process which means in ISO not on Twitter.

We do not want to over-police, the CoC should not become a cudgel that stifles speech. So to make sure we are not overstepping, I raised this all the way up to JTC1 chair and committee manager, with a set of six specific recent “rant” tweets from several different WG21 members, to ask them to rule whether or not this falls under the CoC. They said it clearly did.

WG21 members, anything we say reflects on the committee. Being a WG21 participant gives us rights, such as participating in standardization and on our email lists. It also gives us responsibilities, notably following the ISO and IEC CoCs including on social media. Some have asked, if a person who is not a WG participant is free to say a disrespectful thing X on social media, does that mean that just being a WG participant means they no longer can say X? The answer is yes. We are required to be professional and respectful on social media if we are WG21 members.

I will send a reminder to the “all” reflector for those who are not in this meeting or on the admin mailing list.

John Spicer : We want to make sure we follow the CoC as it makes us more productive and it makes the experience of participating in the committee less stressful. If you have concerns about conduct, please use the conduct mailing list rather than expressing your frustration on social media. We're also encouraging the chairs of study groups to be more on top of any dispute during the meetings, so the minor things can be nipped in the bud. We don't want CoC to be more burdensome than it has to be, but we also want it to make it as effective as it can be. Addressing issues as quickly as we can will make the process more effective.

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

John Spicer presents voting rights.

If you are a non US member registered in the global directory, you get one vote.

If you are a US member, each company gets one vote.

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.

Nina Ranns : 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.

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](#).

PL22/16 motion to approve the meeting agenda

Bryce Adelstein Lelbach moves

Barry Hedquist 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	N4902	N4901
Concurrency Version 2	Editor's report	N4895

Nico Jossutis : the numbers on the screen look wrong.

John Spicer : indeed. The numbers in the official agenda are correct, I will update the slide shown on the screen.

John Spicer updates the presentation slides to reflect the correct documents.

WG21 motion to approve the working drafts.

The motion is unanimously approved by WG21.

Bryce Adelstein Lelbach : Do we need another motion for the Concurrency document ?

John Spicer : no, the motion was to approve both drafts.

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

Meeting	Minutes
WG21 October Virtual	N4898
PL22.16 October Virtual	pl22.16-2021-00023
WG21 pre-February Virtual administrative telecon	N4905

PL22/16 motion to approve the minutes.

Bryce Adelstein LeBach moves.

Barry Hedquist 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

William Miller presents

I have a comment on poll1 : it calls out issue 2502 as being not a DR. This is because it deals with the wording that was introduced after C++20 and so it does not affect C++20. All the resolutions are to be applied to the working paper.

This will be my last plenary as CWG chair. Jens Maurer will take over that position after this meeting. I would like to thank everyone for their encouragement and support over the years that I have been doing this. It's been a joy working with you all. Welcome, Jens. Thank you, everyone.

Bjarne Stroustrup : Thank you.

Herb Sutter : Mike has contributed so much since the very first pl22.16 meeting, including being the CWG chair multiple times. I think Mike is our longest serving subgroup chair who is currently active. Thank you for all your contributions to C++.

John Spicer : I would also like to thank Mike for all the great contributions he has made over the years.

<everyone on the chat> : Thank you, Mike.

1. Accept as Defect Reports all issues except issue 2502 in [P2533R0](#) (Core Language Working Group "ready" Issues for the February, 2022 meeting) and apply the proposed resolutions for all of the issues to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

2. Apply the changes in [P2173R1](#) (Attributes on Lambda-Expressions) to the C++ Working Paper.

No discussion.

No objection to unanimous consent.

Motion passes.

3. Apply the changes in [P2493R0](#) (Missing feature test macros for C++20 core papers) to the C++ Working Paper.

No discussion.

No objection to unanimous consent.

Motion passes.

5.2 LWG Polls

Jonathan Wakely presents. I would like to call out the large editorial changes to the draft. This information has already been circulated on the reflector. We are reorganizing some library wording.

Issues

1. Apply the changes for all Tentatively Ready issues in [P2531R0](#) (C++ Standard Library Issues to be moved in Virtual Plenary, Feb. 2022) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

C++23

2. Apply the changes in [P0323R12](#) (`std::expected`) to the C++ working paper.

No discussion.

Objection to unanimous consent.

Herb Sutter reminds of the voting rules.

In favor : 59

Opposed : 1

Abstain : 11

Motion passes

3. Apply the changes in [P0533R9](#) (`constexpr` for `<cmath>` and `<cstdlib>`) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

4. Apply the changes in [P0627R6](#) (Function to mark unreachable code) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

5. Apply the changes in P1206R7 (`ranges::to`: A function to convert any range to a container) to the C++ working paper.

Nico Josuttis : if we adopt this in the summer meeting, can it make it in for C++23 ?

Jonathan Wakely : yes. We can still accept new things at the next plenary, but there should not be new items forwarded from LEWG.

Nico Josuttis : this adaptor will require empty parentheses which breaks consistency. Was this discussed ?

Bryce Adelstein LeBlach : I believe it was discussed. We have new information that the syntax may be passable. I think we can forward this paper and explore whether we want to change it in the next plenary

Eric Niebler : this is not a view adapter, this produces a container.

Objection to unanimous consent.

In favor : 43

Opposed : 2

Abstain : 24

Consensus.

Motion approved.

6. Apply the changes in P1413R3 (Deprecate `std::aligned_storage` and `std::aligned_union`) to the C++ working paper.

No discussion

Objection to unanimous consent.

In favor: 36

Opposed: 1

Abstain: 29

Herb polls NB. There are 17 NBs present at the meeting.

No NB opposition.

Consensus.

Motion approved.

Bjarne Stroustrup : are abstain votes taken into account and how ?

Herb Sutter : when the numbers of abstention is high, it usually means people haven't been following the paper or don't have an opinion, but are not opposed to it. In these cases, I also like

to dig a bit deeper to make sure there are no controversies. Polling the national bodies shows whether there are strong NB positions that need to be considered.

7. Apply the changes in P2255R2 (A type trait to detect reference binding to temporary) to the C++ working paper.

No discussion

Objection to unanimous consent.

In favor : 40
Opposed : 1
Abstain : 23

Consensus.
Motion approved.

John Spicer : procedures document for working groups and study groups encourage not voting on issues you don't have an opinion on. Abstain in this case means "I'm not voting".

8. Apply the changes in P2273R3 (Making `std::unique_ptr` constexpr) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

9. Apply the changes in P2387R3 (Pipe support for user-defined range adaptors) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

10. Apply the changes in P2440R1 (`ranges::iota`, `ranges::shift_left` and `ranges::shift_right`) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

11. Apply the changes in P2441R2 (`views::join_with`) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

12. Apply the changes in P2442R1 (Windowing range adaptors: `views::chunk` and `views::slide`) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

13. Apply the changes in P2443R1 (`views::chunk_by`) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

6. Closing activities

6.1 Other business

No discussion

6.2 PL2.16 motions, if any

No discussion.

7 Plans for the future (PL22.16)

7.1 Next and following meetings

Herb Sutter presents.

- 2022-07-25 -- July Virtual

- 2022-11-07 to 12 Kona, HI, USA

7.2 Mailings

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

- 2022-02-15: Post-February
- 2022-07-15: Pre-July

8. Adjournment (PL22.16 motion)

Bryce Adelstein Lelbach moves.

Barry Hedquist seconds.

John Spicer adjourns the meeting at 09:08 AM N.Am. Pacific Time

9. Attendance

Name	Country	Organization
Aaron Ballman	US	Intel Corporation
Alexandru Voicu	US	Advanced Micro Devices Inc
Alisdair Meredith	US	Bloomberg
Andreas Fertig	Germany	
Andreas Weis	Germany	
Antony Polukhin	Russian Federation	
Barry Hedquist	US	Perennial
Barry Revzin	US	Jump Trading LLC
Ben Craig		National Instruments
Bill Ash	US	INCITS Secretariat
Bill Seymour	US	Seymour
Billy Baker	US	FlightSaftey International

Bjarne Stroustrup	US	Morgan Stanley
Bronek Kozicki	UK	
Bryan St. Amour	Canada	
Bryce Adelstein Lelbach	US	NVidia Corporation
Casey Carter	US	Microsoft
Christian Trott	US	Sandia National Laboratory
Christof Meerwald	Austria	
Colin MacLean	US	Lawrence Berkeley National Laboratory
Corentin Jabot	France	
Damien Lebrun-Grandie	US	Oak Ridge National Laboratory
Dan Saks	US	Saks & Associates
Daniela Engert		
Daveed Vandevoorde	US	Edison Design Group
David Sankel	US	Bloomberg
David Tenty	Canada	IBM Corporation
Davis Herring	US	Los Alamos National Laboratory
Detlef Vollmann	Switzerland	
Dietmar Kuhl	US	Bloomberg
Ellen Herrick	US	Edison Design Group
Eric Niebler	US	NVidia Corporation
Fabio Fracassi		
Florian Sattler		
Frank Birbacher	US	Bloomberg
Gabriel Dos Reis	US	Microsoft
Gasper Azman	UK	
Glen Fernandes	US	The C Plus Plus Alliance

Graham Lopez	US	NVidia Corporation
Guy Davidson	UK	
Hal Finkel	US	United States Dept of Energy
Hana Dusikova	Czech Republic	
Hans Boehm	US	Google
Harish Naik	US	Acquatic Group LLC
Herb Sutter	US	Microsoft
Howard Hinnant	US	Ripple Labs
Hubert Tong	Canada	IBM Corporation
Inbal Levi	Isreal	
J. Daniel Garcia	Spain	University Carlos III of Madrid
Jason Merrill	US	IBM Corporation
Jean-Paul Rigault	France	
Jeff Hammond	US	NVidia Corporation
Jeff Snyder	UK	
Jens Maurer	US	Edison Design Group
John Lakos	US	Bloomberg
John Spicer	US	Edison Design Group
Jonas Persson	Sweden	
Jonathan Caves	US	Microsoft
Jonathan Wakely	UK	IBM Corporation
Joshua Berne	US	Bloomberg
Juan Alday	US	GreenWireSoft
Kelly Walker	US	Stellar Science
Lawrence Lewis	US	SAS Institute
Lucian Radu Teodorescu	Romania	

Maged Michael	US	Facebook
Marco Foco	Italy	
Mark Zeren	US	VMware, Inc
Mateusz Pusz	Poland	ERAM Systems Inc
Matthias Kretz	Germany	
Matus Chochlik	Slovakia	
Michael Adams	Canada	
Michael Garland	US	NVidia Corporation
Michael Hava	Austria	
Michael Wong	Canada	
Michał Dominiak	Poland	NVidia Corporation
Mike Herrick	US	Edison Design Group
Mingxin Wang		
Nat Linden	US	Linden Research, Inc
Nemania Boric	US	Amazon Corporate LLC
Nevin Liber	US	Argonne National Laboratory
Nicolai Josuttis	Germany	
Nikolas Klauser		
Nina Rans	UK	Edison Design Group
Pablo Halpern	US	Halpern-Wight Inc
Patrice Roy	Canada	
Paul Preney	Canada	
Peter Brett	UK	
Peter Kulczycki	Austria	
Phil Ratzloff	US	SAS Institute
Rene Rivera Morell	US	The C Plus Plus Alliance Inc

Richard Corden	US	Programming Research Ltd
Robert Douglas	US	Acquatic Group LLC
Robert Leahy	Canada	
Robert Simpson	US	Qualcomm
Robert Steagall	US	KEWB Computing
Roger Orr	UK	
Ronan Keryell		Xilinx
Ryan McDougall	Canada	
Sebastian Büttner		
Sebastian Theophil	Germany	
Stephen Schurr	US	Ripple Labs
Steve Downey	US	Bloomberg
Thomas Koeppe	US	Google
Tim Song	US	Jump Trading LLC
Timur Doumler	UK	
Tom Honermann	US	Intel Corporation
Tom Scogland	US	Lawrence Livermore National Laboratory
Victor Zverovich	Canada	
Ville Voutilainen	Finland	The Qt Company
Walter E Brown	US	Brown
Wesley Maness	US	Schonfeld Tools LLC
William Miller	US	Edison Design Group
Xavier Bonaventura	Germany	
Xu Chuanqi	China	
Zhihao Yuan		Broadcom Inc

