

WG21 2021-02 Virtual Meeting

Record of Discussion

ISO/IEC JTC1 SC22 WG21 P2330 — 2021-03-08

Nina Dinka Ranns, dinka.ranns@gmail.com

Chair: John Spicer
SC22/WG21 pre-meeting telecon

Monday 2021-02-22
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.

Thank you to everyone for your continuing efforts in these challenging times.

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](#)

John Spicer presents the meeting guidelines. We expect everyone to be familiar with these rules. These apply to the plenary and to all the subgroup meetings

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

ISO requires that, through 2020, committees provide an opportunity to discuss the code of conduct.

John Spicer presents ISO CoC slides.

Please report any CoC violation to @conduct even if you also report it to the subgroup chair.

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.

1.5 Introductions

Officers introduce themselves.

New members introduce themselves.

John Spicer welcomes new members.

Herb Sutter: We have 18 national bodies present at this virtual meeting.

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

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

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

John Spicer presents the agenda.

PL22/16 motion to approve the meeting agenda
Barry Headquist Moves
Jonathan Wakely seconds.
The motion is unanimously approved by PL22/16.

WG21 motion to approve the meeting agenda, with the changes to the agenda as discussed.
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	N4879	N4878
Library Fundamentals TS	N4874	N4873

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 November Virtual	N4877
PL22.16 November Virtual	pl22.16-2020-00009
WG21 pre-February Virtual administrative telecon	N4883

PL22/16 motion to approve the minutes.
Daveed Vandevorde moves.
Nevin Liber 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

5.1 CWG Polls

Mike Miller presents.

Regarding CWG motion 1 : we adopted P2238 at the last plenary, but at that point we have not considered whether each individual fix should be a DR against C++20 or not. We have considered it since and have decided all the resolved issues should be considered as DRs against C++20.

We only had 2 meetings since the last plenary so we do not have many other issues resolved at this point in time.

1. Accept as Defect Reports the the following issues (all issues resolved by [P1787R6](#) (Declarations and where to find them), adopted at the November, 2020 meeting):

36	110	138	191	255	271	279	338	360	386
399	405	418	536	554	562	563	600	607	852
952	1028	1200	1252	1291	1478	1500	1616	1729	1771
1818	1820	1821	1822	1828	1829	1835	1837	1839	1841
1884	1894	1896	1898	1900	1907	1908	1936	2007	2009
2058	2062	2065	2070	2165	2199	2213	2331	2370	2396
2413									

No discussion.

No objection to unanimous consent.

Motion passes.

2. Accept as Defect Reports all issues in [P2313R0](#) (Core Language Working Group "tentatively ready" Issues for the February, 2021 meeting) and apply the proposed resolutions to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

3. Apply the changes in [P1102R2](#) (Down with (!)) 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 motion 4 which has a new version attached to the wiki.

John Spicer : Do we need further clarification ?

Nico Jossutis : Is this a semantic or syncatic change ?

Barry Revzin : there are no semantic changes, we are saying the same thing better.

Jonathan Wakely : LWG reviewed the paper, asked for some changes and approved those changes, but it didn't get into the mailing. Barry spotted this last week and corrected it. The correct version was uploaded to the wiki, but the motion wasn't updated until today. In terms of semantic changes, there are none.

John Spicer : the policy is to explain any changes that happen to the straw polls after the deadline, regardless of the magnitude of changes.

Issues

1. Apply the changes for all Tentatively Ready issues in [P2315R0](#) (C++ Standard Library Issues to be moved in Virtual Plenary, Feb. 2021) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

C++23

2. Apply the changes in [P2259R1](#) (Repairing input range adaptors and counted_iterator) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

3. Apply the changes in [P2212R2](#) (Relax Requirements for time_point::clock) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

4. Apply the changes in [P2162R2](#) (Inheriting from std::variant) to the C++ working paper.

Peter Brett : I disagree that this fixes the problem.

John Spicer : has this been raised as a concern?

Peter Brett : I have mentioned it to some people

Herb Sutter : Bryce, was this question considered ?

Bryce Adelstein Lelbach : I do not know if have discussed this. I will check.

There are objections in the room.

Nico Josuttis : to be able to vote, I need to know if there is a problem if we were to postpone this paper.

Jonathan Wakely : we haven't discovered anything new. The objection is that the rules have not been relaxed enough.

Bryce Adelstein Lelbach : I just reviewed the minutes. Yes, this was discussed in LEWG. We did discuss future extensions, and we believe that nothing we do now precludes future extensions.

Ville Voutilainen : if people want these future extension, they should vote yes as this change helps those future extensions.

Tony van Eerd : I have also brought this up in an email.

John Spicer : given the discussion, are there still objections in the room

No objection to unanimous consent.

Motion passes.

5. Apply the changes in [P2160R1](#) (Locks lock lockables) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

6. Apply the changes in [P2017R1](#) (Conditionally borrowed ranges) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

7. Apply the changes in [P1682R2](#) (std::to_underlying for enumerations) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

8. Apply the changes in [P0533R7](#) (constexpr for cmath and cstdlib) to the C++ working paper.

Hubert Tong : I've put out a few emails last week to ask if certain considerations were discussed. I have not received confirmation either way. This is related to the treatment of error conditions in this paper.

Jonathan Wakely: LWG have touched on the lack of precision in which errors can prevent constant expression, the decision in LWG was to go ahead and put it on the straw polls page anyway. Hubert

has suggestions on how to make it more precise.

Davis Herring: we don't have the numerics chairs on the call.

Herb Sutter : we do have a LEWG and LWG chairs, and they have reviewed it. Bryce, do you have anything to add ?

Bryce Adelstein Lelbach : I don't believe this particular question has been discussed in LEWG.

Bjarne Stroustrup : Does anything block the improvements that you want ?

Hubert Tong : implementors need to understand how to implement this paper. The paper cites implementation experience, but it doesn't implement what is talked about. Implementors will not know what to implement and you will not get the improvements that you want. It will either not be implemented or you will get implementation divergence.

Bryce Adelstein Lelbach : LEWG approved this before C+20. The design of `is_constant_evaluated` hasn't settled yet, but we knew it was coming. Concerns were raised about implementability. We have more information now.

Jonathan Wakely : the implementors in LWG raised the concern too, but wanted this to go further and give feedback when they try to implement it. We need more implementors to look at it, and we may need to put in the draft to get that. We can take it out if we find it is not implementable. The paper has been there for 5 years and noone tried doing anything .

John Spicer : are there still objections in the room ?

There are objections in the room.

Herb Sutter clarifies the rules of voting

John Spicer clarifies how to vote.

In favour : 31

Opposed : 22

Neutral : 18

No consensus. Motion doesn't pass.

5.3 LEWG Polls

Motion 1

Move to apply the changes in [P1919R3](#) (Expanding the Rights in SD-8) to Standing Document 8 (SD-8: Standard Library Compatibility).

Bryce Adelstein Lelbach : this is a paper that applies to a standing document, not to the standard or a TS. The SD8 was created by an LEWG motion. The chairs discussed this and we have decided that LEWG approval is all that is needed for this change and that the motion should come from LEWG.

No discussion.

No objection to unanimous consent.

Motion passes.

6. Closing activities

6.1 Other business

Jonathan Wakely reminds attendees to update their virtual meeting client.

6.2 PL2.16 motions, if any

John Spicer reminds of voting rights for PL22.16

1. TR 18015 National Review

Barry : We have this TR which we planned on changing, but haven't gotten anywhere with it. We are going to re-affirm it. If nothing happens in the next 5 years, we will get rid of it.

Barry Hedquist moves.

Davis Herring seconds.

No objection to unanimous consent.

Motion approved.

7 Plans for the future (PL22.16)

7.1 Next and following meetings

Herb Sutter presents.

There is a question on the chat about the virtual meeting client poll feature. We tried it, and we couldn't make it work.

Thank you to hosts who have had to postpone. We are looking forward to seeing you in the future.

When we have dates, we will inform everyone. We will have virtual meetings until then.

(virtual) 2021-06-07: Zoom virtual plenary meeting

(virtual) 2021-10-04: Zoom virtual plenary meeting

2022-02-07 to 12: Portland, OR, USA; Intel

2022-07: New York, NY, USA; Bloomberg

2022-11-07 to 12: Kona, HI, USA: Standard C++ Foundation

7.2 Mailings

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

2021-06-15: Post-Summer

2021-09-15: Pre-Autumn

8. Adjournment (PL22.16 motion)

Daveed Vandevoorde moves

Davis Herring seconds

John Spicer adjourns the meeting at 09:22 AM N.Am. Pacific Time

9. Attendance

Name	Organisation	National Body
Aaron Ballman	Intel Corporation	USA
Abraham Berne		
Alexandru Voicu	AMD	USA
Alisdair Meredith	Bloomberg	United Kingdom
Andreas Weis		Germany
Balint Joo	Oak Ridge National Laboratory	USA
Barry Hedquist	Perennial	USA
Barry Revzin	Jump Trading LLC	USA
Ben Saks	Saks & Associates	USA
Bill Ash	INCITS	
Billy Baker	FlightSafety International	USA
Bjarne Stroustrup	Morgan Stanley	USA
Botond Ballo		Canada
Bronek Kozicki		United Kingdom
Bruno Cardoso Lopes	Facebook	USA
Bryan St. Amour		Canada
Bryce Adelstein Lebach	NVidia Corporation	USA
Christian Trott	Sandia National Laboratories	USA
Christof Meerwald		Austria
Damien Lebrun-Grandie	Oak Ridge National Laboratory	USA
Damon McDougall	AMD	USA
Dan Raviv		
Daniela Engert	GMH Prüftechnik GmbH	
Daveed Vandevoorde	Edison Design Group	USA
David Olsen	NVidia Corporation	USA
David Vitek	GammaTech Inc	USA
Davide Di Gennaro		Italy
Davis Herring	Los Alamos National Laboratory	USA
Detlef Vollmann		Switzerland
Dietmar Kühl	Bloomberg	USA
Dounia Khaldi	Intel Corporation	USA
Drew Dormann	Aquatic Group LLC	USA
Ellen Herrick	Edison Design Group	
Eric Niebler	Facebook	USA
Erich Keane	Intel Corporation	USA
Eugenio Bargiacchi	Vrije Universiteit Brussel	
Fabio Fracassi		Germany
Florian Sattler		

Frank Birbacher		United Kingdom
Gabriel Dos Reis	Microsoft France	France
Gašper Ažman		United Kingdom
Graham Lopez	NVidia Corporation	USA
Guy Davidson		United Kingdom
Hal Finkel	United States Dept of Energy	USA
Hana Dusíková		Czech Republic
Hans Boehm	Google	USA
Harish Naik	Aquatic Group LLC	USA
Herb Sutter	Microsoft Corporation	USA
Howard Hinnant	Ripple Labs	USA
Hubert Tong	IBM Corporation	Canada
Inbal Levi		Israel
J. Daniel Garcia	University Carlos III of Madrid	Spain
Jason Merrill	IBM Corporation	USA
JC van Winkel		Netherlands
Jean-Paul Rigault		France
Jeff Garland	Crystal Clear Software	
Jeff Snyder		United Kingdom
Jens Maurer	Edison Design Group	USA
Joe Sachs	SAS Institute Inc	USA
John Lakos	Bloomberg	USA
John Spicer	Edison Design Group	USA
Jonathan Caves	Microsoft Corporation	USA
Jonathan Wakely	IBM Corporation	United Kingdom
Joshua Berne	Bloomberg	
Juan Alday	GreenWireSoft	USA
Kelly Walker	Stellar Science	USA
Larry Lewis	SAS Institute Inc	USA
Loïc Joly		France
Louis Dionne	Apple	USA
Lucian Radu Teodorescu		Romania
Łukasz Wojakowski		Poland
Maged Michael	Facebook	USA
Marco Foco		Italy
Mark Hoemmen	Stellar Science	USA
Mark Zeren	VMware Inc	USA
Mateusz Pusz	EPAM Systems Inc	USA
Matthew Butler	Laurel Lye	USA
Matthias Kretz		Germany
Michael Adams		Canada
Michael Davis		
Michael Hava		Austria
Michael Spencer	Apple	USA
Michael Spertus	Amazon Corporate LLC	USA
Michael Wong		Canada
Michał Dominiak	NVidia Corporation	USA
Mike Herrick	Edison Design Group	USA
Mitsuhiro Kubota		Japan
Nathan Sidwell		UK

Nemanja Boric	Amazon Corporate LLC	USA
Nevin Liber	Argonne National Laboratory	USA
Nicolai Josuttis		Germany
Nina Ranns		United Kingdom
Pablo Halpern	Halpern-Wight Inc	USA
Patrice Roy		Canada
Paul Preney		Canada
Peter Brett		United Kingdom
Peter Kulczycki		Austria
Phil Ratzloff	SAS Institute Inc	USA
Richard Corden	Programming Research Ltd	USA
Rob Douglas	Aquatic Group LLC	USA
Robert J. Simpson	Qualcomm Inc	USA
Robert Leahy		Canada
Roger Orr		United Kingdom
Samuel Ferreira Santos		
Scott Schurr		
Stephen Upton	Programming Research Ltd	USA
Steve Downey	Bloomberg	
Thomas Köppe	Google	
Tim Song	Jump Trading LLC	USA
Tom Honermann	Synopsys Inc	USA
Tony Van Eerd		Canada
Vassil Vassilev		Bulgaria
Ville Voutilainen	The QT Company	Finland
Vittorio Romeo		Italy
Wesley Maness	Schonfeld Tools LLC	USA
William Miller	Edison Design Group	USA
Wuping Xin	KLD Engineering P.C.	USA
Zhihao Yuan	SimpleRose Inc	