WG21 2025-06 Sofia Admin telecon minutes

SC22/WG21 pre-meeting telecon
Convener: Herb Sutter
Date : Monday 2025-06-02
Time: 16:00 UTC

1 Opening and introductions

Herb Sutter opens the meeting at 16:03 UTC.

1.1 Roll call of participants

Herb Sutter
Matthias Kretz
Billy Baker
Roger Orr
Jeff Garland
John Spicer
Inbal Levi
Jonathan Müller
J.D. Garcia
Jens Maurer
Tom Honermann
Hubert Tong
Hana Dusíková
Erich Keane
Nina Dinka Ranns
Nevin Liber
Michael Wong
Jonathan Wakely
Barry Revzin
Detlef Vollmann
Jeff Snyder
W E Brown

1.2 Adopt agenda

No objections.

Agenda adopted.

1.5 Review of project editor and liaison assignments

Status page

Status page is up to date.

2. Status reports

2.0 Advisory subgroup status reports

• **Meeting logistics**: Jens Maurer

We will have a total of six meeting rooms available in Sofia. Four major subgroups will meet throughout the entire week. In addition, we have approximately 1.5 meeting room allocations reserved for supplementary subgroup meetings. Everything is looking good so far.

The welcome meeting will take place on Sunday at 6:00 PM in the hotel lobby. I will also try to arrange a Zoom meeting option.

• **AG**, Admin group: Nevin Liber

We've had three mailings since the Hagenberg meeting, as well as one meeting focused on GitHub coordination.
Inbal is overseeing the collection of GitHub handles.
We hope to have the attendance sheet published this afternoon.
There are no plans for this subgroup to meet in Sofia.

Inbal Levi: Chairs, please inform your group members to send me their GitHub handles before the meeting. Nina will be managing guest GitHub access.
Many thanks to Wyatt and Jens for setting up the infrastructure.
This access is intended for use during the meeting. We can also post the request on the wiki as a reminder.

Herb Sutter: Thank you for figuring this out. We will get a surge of requests on Monday. It would be helpful to send it to the meeting reflector as a reminder.

Herb Sutter: There is an administrative paper from Jan Schultke. Where should that go ?
Nevin Liber: Admin group is the correct group..

Roger : Can someone put the github info in the persistent information ?
A.P. Nina

Matthias Kretz : would it be useful to make it private before the meeting to test and to encourage people to send the info ?

Inbal Levi : We aimed for this Friday, but it is a good idea.
Jens Maurer : On this friday, June 6?
Inbal Levi : Yes

• **DG**, Direction group: Michael Wong

We continue to meet regularly. Our recent discussions have focused primarily on slow-moving papers, such as those related to Hive, Fibers, and to some extent, Relocation.

We observed a recurring pattern among these papers: many are authored by a single individual or originate from a single company. We plan to make a statement regarding this trend.

Additionally, we discussed ongoing topics concerning profiles and other safety-related features, and where those discussions are heading.

• **ARG**, ABI review group: Daveed Vandevoorde, Jason Merrill

ARG has had no queries since the last meeting and, as usual, does not plan to meet in person in Sofia.

2.1 Pipeline stage 1 groups: Specialist subgroup status reports (Sgs)

SGs 2, 3, 5, 8, 11, 12, and 13 are currently dormant and handled in the main subgroups. The active SGs are:

• **SG1**, Concurrency: Olivier Giroux, Hans Boehm, Ruslan Arutyunyan

As usual, SG1 has not met between meetings. For Sofia, we have a light load of papers at this meeting. Expect a late paper or two. We should plan to meet for 2 to 2.5 days.

• **SG4**, Networking: Jeff Snyder, Gašper Ažman

SG4 has not met since hagenberg. We don't have any plans to meet in Sofia.

• **SG5**, Transactional Memory: Hans Boehm

MichaelWong : I have issued the whitepaper for transactional memory to Hans and I'm waiting for his blessing for it to go out.

Herb Sutter: SG5 has not been meeting.

• **SG6**, Numerics: Matthias Kretz, Lisa Lippincott, John McFarlane

SG6 plans to meet for a total of one day in Sofia. We have 9 papers on our agenda. Of these, P3045R5 "Quantities and units library", P3642R0 "Carry-less product: std::clmul", and P3639R0 "The _BitInt Debate" might get discussed in joint session with SG18 (LEWG-I).

SG6 will continue in Sofia with several papers on (controlling) floating-point

behavior:

- P3715R0 Tightening floating-point semantics for C++
- P3714R0 Virtual values have Virtual Value
- P3565R1 Virtual floating-point values
- P3375R3 Reproducible floating-point results

Please join our discussion if you care about the topic.

• **SG7**, Compile-time programming: Hana Dusíková, Jeff Snyder

SG7 plans to see P3678 "Arbitrary attributes in define_aggregate" and P3603R0 "Consteval-only Values and Consteval Variables". I requested only 1/4 of a day (preferably in the morning on Monday after plenary). SG7 didn't meet since the last in-person meeting. I expect some new papers to arrive once Reflection papers authors won't be tied to CWG/LWG.

Herb Sutter : Are you anticipating any design question for reflection ?
Hana Dusíková : there is one paper in evolution telco this week. I'm not aware of anything else.
Jens Mauer : there was at least one EWG meeting for accumulated reflection issues. I don't recall anything big since then.
Hubert Tong : some things may be circling to LEWG.
Inbal Levi: I have Dan's paper pending on the results from EWG. P3687 and a paper on std::meta::exception inherit from std::exceptions. That's scheduled for the first day in Sofia. If anything comes up, please let us now as soon as possible
Hubert Tong : Various chairs may want to look at revision of P2996.
Hana Dusíková : We will not proactively take things back unless Jens lets us know that we should do that.

• **SG9**, Ranges : Jonathan Müller, Zach Laine

SG9 has not met between meetings.

We have requested one day and have seven papers in queue, plus one late paper. Of those seven, one is a bug fix for C++26, one is an LWG issue, one is a new revision of the `any_view` paper for C++29, and four papers targeting C++29 we haven't seen yet.

I'm hoping we will get another "A plan for C++29 ranges" paper to help prioritize our work for C++29.

• **SG10**, Feature test: Barry Revzin, Jonathan Wakely

SGX doesn't meet, but the feature-test macro document has been updated recently so that it's now current through Hagenberg:
https://isocpp.org/std/standing-documents/sd-6-sg10-feature-test-recommendations

Please let me know if anything looks amiss.

• **SG14**, Low latency: Michael Wong

SG14 continues to host monthly telecons with reports [P3693R0](#) of low latency features and P3676 the inline proposal as well as the Reproducible Floating Point. We will not meet F2F.

• **SG15**, Tooling: Michael Spencer, Ben Boeckel

No report.

• **SG16**, Unicode: Tom Honermann, Steve Downey

SG16 continues to meet approximately twice monthly. We do not intend to meet during Sofia so as not to contribute to quorum challenges. As far as I am aware, there are no papers targeting C++26 that require further SG16 review.
SG16 will meet one more time before Sofia. The goal of that meeting will be to settle on a resolution for [CWG 2843 (Undated reference to Unicode makes C++ a moving target)](#). An NB comment requesting resolution of that issue is anticipated for C++26 and we intend to have a reviewed resolution prepared well ahead of time for whenever CWG can spare time to review it.
SG16 has met 8 times and reviewed the following 14 papers since the pre-meeting admin meeting for Hagenberg on 2025-01-27.
- [P2758R4: Emitting messages at compile time](#)
- [P2873R3: Remove Deprecated locale category facets for Unicode from C++26](#)
- [P3263R0: Encoding annotated char](#)
- [P3391R0: constexpr std::format](#)
- [P3395R0: Formatting of std::error_code](#)
- [P3412R1: String interpolation](#)
- [P3474R0: std::arguments](#)
- [P3491R2: define_static_{string,object,array}](#)
- [P3556R0: Input files are source files](#)
- [P3560R0: Error Handling in Reflection](#)
- [P3655R0: std::zstring_view](#)
- [P3657R0: A Grammar for Whitespace Characters](#)
- [P3658R0: Adjust identifier following new Unicode recommendations](#)
- [P3671R0: Clarifying the interaction of the literal and execution encodings](#)

Minutes are even further behind in being published than they were before the Hagenberg meeting, but efforts are slowly being made to get caught up.

• **SG17**, EWG incubator: Erich Keane, James Touton

SG17 (EWGI) intends to meet for time totaling 1 day. We will review as many papers as that and attendance permits (likely about 12).

• **SG18**, LEWG incubator: Billy Baker, Nevin Liber

SG18 LEWGI has requested two half days in Sofia. We have not any zoom meetings since Hagenberg and have plenty of papers to discuss. Coordination with SG6 on P3045 Quantities and units is continuing.

• **SG19**, Machine learning: Michael Wong, Phil Ratzloff

SG19 continues to host monthly telecons with reports [P3694R0](). We continue to review the papers for Stats and Graph. We will not meet F2F.

• **SG20**, Education: JC van Winkel

SG20 (Education) does plan to meet in Sofia (½ day). We intend to use our time to plan for the future work (mostly more teaching guidelines) and on our interaction with WG21 as a whole. If we have time left over, we will work on teaching guidelines (which we usually do in video calls).

• **SG21**, Contracts: John Spicer, Timur Doumler

SG21 (Contracts) does not plan to meet in Sofia, as we currently do not have any papers on our agenda.

We expect to be more active again after Sofia as we expect Contracts-related NB comments and associated papers to be submitted.

• **SG22**, C/C++ liaison: Nina Ranns, JeanHeyd Meneide, Davis Herring

SG22 met once since Hagenberg to discuss :
CWG3017 Commas in controlling expression of conditional inclusion
P3412 R1 String interpolation

We will meet one more time before Sofia to discuss :
P3540 R1 #embed Parameter offset
P3568 R1 break label; and continue label
P3639 R0 The _BitInt Debate

SG22 will not meet in Sofia.

WG14 update, courtesy of Robert Seacord:

ISO/IEC TS 18661-4:2025
Programming languages, their environments, and system software interfaces — Floating-point extensions for C
Part 4: Supplementary functions
Published (Edition 2, 2025)
https://www.iso.org/standard/83622.html

ISO/IEC TS 18661-5:2025
Programming languages, their environments, and system software interfaces — Floating-point extensions for C
Part 5: Supplementary attributes
Published (Edition 2, 2025)
https://www.iso.org/standard/83623.html

WG14 will be holding a hybrid meeting 25th to 29th August 2025 in Brno, Czechia
https://www.open-std.org/jtc1/sc22/wg14/www/docs/n3541.htm

• **SG23**, Safety and Security: Roger Orr, Matthew Butler

SG23 has not met online between meetings.
We have requested a day in Sofia and may need to meet online between Sofia and Kona as we have around a dozen papers in our list.

2.2 Pipeline stage 2 groups: Design subgroup status reports

• **EWG**, Core evolution: JF Bastien, Hana Dusíková, Erich Keane

We've had a handful of teleconferences so far. One focused on the Safety and Security whitepaper, and a follow-up discussion on reflections is scheduled. Throughout the week, we'll be meeting regularly, with our primary focus on reviewing C++29 papers. However, please note that our schedule may be paused at a moment's notice if CWG requires our attention.

• **LEWG**, Library evolution: Inbal Levi, Fabio Fracassi, Andreas Weis

Telecons Workload
LEWG have met 12 times (will turn to 13 post Tue) between Hagenberg and Sofia, and seen the following papers:
1. P3365R0: Remove deprecated `iterator` template (forwarded to LWG)
2. P3366R0: Remove Deprecated Atomic Initialization API from C++26 (forwarded to LWG)
3. P2873R2: Remove Deprecated locale category facets for Unicode from C++26 (forwarded to LWG)
4. P2781R7: std::constant_wrapper (Sent back to LWG with feedback)
5. P3371R3: Fix C++26 by making the rank-1, rank-2, rank-k, and rank-2k updates consistent with the BLAS (forwarded to LWG)
6. P3295R2: Freestanding constexpr containers and constexpr exception types (forwarded to LWG)
7. P3388R1: When Do You Know connect Doesn't Throw? (forwarded to LWG)
8. P3395R3: Formatting of std::error_code (needs-revision)
9. P3480R4: std::simd is a range (forwarded to LWG)
10. P3663R0: Future-proof submdspan_mapping? (forwarded to LWG)
11. P3552R1: Add a Coroutine Task Type (forwarded to LWG)
12. P3391R0: constexpr std::format (forwarded to LWG)
13. P3373R1: Of Operation States and Their Lifetimes (forwarded to LWG)
14. P2956R0: Add saturating library support to std::simd (forwarded to LWG)
15. P3125R4: constexpr pointer tagging (forwarded to LWG)
16. P2996R12: Reflection for C++26 ("constant_of"/"reflect_constant") (Sent back to LWG with feedback)

17. [P3617R0](#): std::meta::reflect_constant_{array,string} (applied on relevant paper)
18. [P3685R0](#): Rename async_scope_token (applied on relevant paper)
19. [P3706R0](#): Rename join and nest in async_scope proposal (applied on relevant paper)
20. [P3149R10](#): async_scope – Creating scopes for non-sequential concurrency (changes split into a seperate paper, to be seen later)
21. [P3698R0](#): Cross-capacity comparisons for inplace_vector (pending review)
22. [P3146R2](#): Clarifying std::variant converting construction (pending review)
23. In reflector review: [P3008R4](#): Atomic Floating Point Min/Max" (POLL for adding functions to "cmath" not addressed as part of the C++ on C23 rebase)

Minutes for the papers (updated in the wiki, linked from our telecons page):
https://github.com/cplusplus/LEWG/wiki/2025-Telecons

Sofia Information
- LEWG Sofia page: https://wiki.edg.com/bin/view/Wg21sofia2025/LibraryEvolutionWorkingGroup
- LEWG Sofia (tentative) agenda: https://github.com/orgs/cplusplus/projects/40 (linked from wiki as well)
- LWG priorities (voted in LEWG, adjusted according to feedback from LWG): https://github.com/cplusplus/LEWG/wiki/LWG-Priorities
- We will have a "Policies" discussion focused on explicit constructors. We'll continue with other topics post Sofia.

Thank you to all the group chairs for great collaboration, to paper authors (including those who submitted fixing papers - sometimes for their own papers), to all our attendees - without whom we couldn't have achieved high quality of review, and most of all to LWG for the concentrated effort for to finalize reviews on our B1 features and C++26 fixes in time for Sofia plenary.

Looking forward to seeing you in Sofia!

2.3 Pipeline stage 3 groups: Wording subgroup status reports

• **CWG**, Core wording: Jens Maurer, Jason Merrill, Jonathan Caves

CWG has had weekly teleconferences reviewing P2996 Reflection, and will continue to focus on that paper with a goal to have it ready for the CD in Sofia.

There are a number of other reflection-related papers that will considered with elevated priority, provided P2996 leaves enough time:

    P3293R1 Splicing a base class subobject
    P3491R2 define_static_{string,object,array}
    P3096R8 Function Parameter Reflection in Reflection for C++26
    P3394R2 Annotations for Reflection

Beyond that, the following two papers are handled by LWG, but require CWG input on minor aspects:

    P2830R10 Standardized Constexpr Type Ordering
    P3111R5 Atomic Reduction Operations

Other pending papers will be addressed as time permits.

• **LWG**, Library wording: Jonathan Wakely, Jeff Garland, Dietmar Kühl

LWG have been holding weekly telecons to review the papers forwarded by LEWG. We've completed reviews of:

P3179 Parallel range algorithms
P3037 constexpr std::shared_ptr and friends
P3284 write_env and unstoppable Sender Adaptors

We will have one more telecon this Friday, continuing the review of P3557 (high-quality sender diagnostics with constexpr exceptions).

We will be meeting all week in Sofia and expect to be very busy as we try to work through as much of our queue as possible. I'll be very surprised if we manage to get even halfway through it. Jeff will make a schedule available, but I expect there will be plenty of reshuffling throughout the week. Please keep an eye on the mailing list and Mattermost for any scheduling changes.

We also have a large backlog of library issues to process, which probably won't happen in Sofia but we need to spend some time on them soon.

Jeff Garland : There is a library prioritization list from LEWG. We apologise for the features that don't make it
Herb Sutter : Please reach out to the authors if you can tell that some papers are unlikely to make it. Remind them that the train for C++29 is about to open.

Hubert Tong : which C standard are we referencing ?
Jonathan Wakely : LWG approved rebase of C23, but it's not complete. It doesn't have all the math.h changes. We need someone to write a paper to address the missing bits.

Jonathan Müller : P3552 has the highest priority for LEWG. Did we change the priorities?
Inbal Levi : It was prioritized during the LWG 2025-05-30 telecon. This is the only feature that has been forwarded post Hagenberg. During the discussion there were technical arguments from LEWG members to ship this utility within the same version as S/R .We are prioritizing it to increase consensus as we know some people will raise NB issues.

2.4 SC22 report

We received the updated editors guidance. I do not intend to run as a Convener as mentioned earlier, but I will be helping the new person. We will not know who that is until NB's go through the process of nominating people.

Nothing else affects us.

Michael Wong : thank you for all the years of dedicated service. Can we have multiple candidates from a national body?

Herb Sutter : ask Bill Ash. Your NB may have additional rules.

Hubert Tong : There was a discussion regarding UB whitepaper. I'm not sure if we resolved the potential for understanding at which level the larger review happens. Does it happen at SC22 or WG21 level ?

Herb Sutter : SC22 takes a document from WG21 and votes yes/no. In WG21 we follow our normal process. If we think it's done and we want to solicit a NB review, we can do that.

Inbal Levi : The first meeting in 2026 is in April. Is that going to delay the process of publishing the next standard ?

Herb Sutter : In Sofia, we will finalize the feature set. Following that, we will initiate the Committee Draft (CD) ballot, which will take place between the Sofia and Kona meetings. Over the next two meetings, we'll address the national body (NB) comments and resolve any outstanding issues. At the first meeting in 2026, we plan to vote the document out for publication.

2.5 SC22/WG14 (C) report (covered in 2.1 / SG22)

3. New business

3.1 Review of priorities and target dates

• Status page
• P1000

At the Sofia meeting we will be wording-complete and finalise the content of C++26. Then we start the CB ballot. We will be resolving the NB comment in Kona and the first meeting in 2026. We will then send the (check tape)

3.2 Any other business

Hana : I have the dates for next year's summer meeting: June 22–27, in Brno, Czech Republic.

4.1 Review and approve resolutions and issues

4.2 Review action items

5. Closing process

5.1 Establish next agenda

Herb Sutter : I propose the same agenda with the updates chair information as suggested.
No objections.

5.4 Adjourn

Meeting adjourned at 17:07 UTC