

Doc No: SC22/WG21/N3316
PL22.16/11-0086
Date: 2011-09-02
Project: JTC1.22.32
Reply to: Kyle Kloepper
Riverbed Technology
Kyle.Kloepper@riverbed.com

Minutes

PL22.16 Meeting No. 57
WG21 Meeting No. 52
15-19 August 2011 Bloomington, Indiana, USA

1. Opening activities

Clamage calls the meeting to order at 9:07 (UTC-5) Monday 15 August 2011.

1.1 Opening comments, welcome from host

Andrew Lumsdaine welcomes the attendees and provides organizational information.

1.2 Introductions

Clamage has attendees introduce themselves.

1.3 Meeting guidelines (Anti-Trust)

Clamage directs group to the following websites without further comment:

- http://www.incits.org/pat_slides.pdf
- <http://www.incits.org/inatrust.htm>

1.4 Membership, voting rights, and procedures for the meeting

Clamage reviews the rules for membership and voting rights. Nelson reviews guidelines for filling in the attendance sheet.

1.5 Agenda review and approval

Clamage presents the agenda (document PL22.16/10-0035 = WG21/N3265).

Motion to approve the agenda:

Moved by: Clamage

Seconded by: Brown

PL22.16		WG21	
In favor:	23	In favor:	7
Opposed:	0	Opposed:	0
Abstain:	0	Abstain:	0

1.6 WG progress reports and work plans for the week

Progress Reports

Each Working Group chair presents group progress and plans for the coming week.

Core Working Group (CWG)

Miller reports no issues list in the pre-meeting mailing and no new issues since previous issues list. This week CWG will look at new issues since pre-Madrid. CWG will also look at a few unresolved issues in the FDIS. Miller also welcomes discussion of ideas for future papers.

Brown asks if CWG will be reviewing papers not previously processed. Miller says yes. Brown will direct Miller to the paper.

Library Working Group (LWG)

Meredith reports LWG is in good shape. He will generate formal issues from the Wiki. There are around 50 issues to process this week. The main concern is the unknown direction Library will take for future. Also Hinnant has [four late papers](#). Hinnant notes that Beman Dawes's [Filesystem paper](#) is one of them.

Concurrency Working Group

Crowl reports there is not much work other than a single issue. Clamage asks if there will be a breakout session. Crowl says no.

1.7 Approval of the minutes of the previous meeting

Nelson asks what the status of the ISO ballot was. Clamage states that it passed: ISO approved, ANSI accepted.

Motion to approve the minutes (N3274/N3275)

Moved by: Brown

Seconded by: Hedquist

PL22.16		WG21	
In favor:	23	In favor:	7
Opposed:	0	Opposed:	0
Abstain:	0	Abstain:	0

1.8 Liaison reports

WG14 Report

Plum reports that the DIS for C is still in ballot and there have been no changes since last WG21 meeting.

WG23 Report

Plum announced that WG23 will approach WG21 to work on a vulnerabilities annex for C++. Plum gives an overview of WG23:

WG23 meets 3-4 times per year with the goal of putting together a number of language specific safety and security issues list. Each language will put in a separate annex. Python is already done. Ada has two: ISO Ada and Spark Ada. WG23 is looking for someone to work on Java Script as it has many real vulnerabilities.

1.9 Editor's report

Becker reports INCITES has three weeks to publication after responses. Brown asks if there is a backup editor. Crawl responds that he was the backup editor. Brown asks if he would like to continue. Crawl expresses indifference. Plum advocated that he continue as the backup editor. Plum states the purpose of the backup editor is to ensure the production of the standard document is not dependent any one person or proprietary technology.

1.10 New business requiring actions by the committee

Plum states dates for next meeting in Kona is 6-10 February 2012.

Nelson asks if we are going to talk about language direction. Clamage notes that logical people for that discussion are not yet present. Vollmann would like to discuss language direction as was planned during teleconference. He asks if we can meet later since Sutter has not yet arrived. Clamage says we are meeting either later this afternoon or tomorrow.

2. Organize subgroups, establish working procedures.

Clamage announces that those present will break up into working groups until Thursday afternoon. He notes that the committee was in recess until then.

3. WG sessions (Core and Library).

The group breaks up to meet in separate working group sessions.

Tuesday 16 August 8:30 a.m. - 5:30 p.m.

4. WG sessions continue.

Wednesday 17 August 8:30 a.m. - 5:30 p.m.

5. WG sessions continue.

Thursday 18 August 8:30 a.m. - 12:00 p.m.

6. WG sessions continue.

Thursday 18 August 1:30 a.m. – 2:00 p.m.

7. General session.

7.1 WG status and progress reports.

Clamage calls general session to order. He announces a change from published agenda. There will be a general session tomorrow morning to discuss future directions

for the language. After that closing ceremonies will be held at 11 a.m. Clamage asks if there are any objections. There are none. Clamage asks for working group status reports.

Core Working Group

Miller reported that CWG has no motions and there were no papers or new issues in the pre-meeting mailing. CWG has been collecting issues from the reflector and through direct emails. That gave 96 new issues. The Clang developers presented a paper giving 24 new issues. All 120 issues were looked at. 40 have drafting in ready status. There are a dozen or so more things to look at this afternoon. Plan to have a latency of one meeting changing issues from ready status to moved status. The issues in ready status at this meeting will be moved in Kona.

Three issues of note:

1. CWG 496 – modifies what standard states about lvalues. Volatile types are no longer trivially copyable
2. CWG 1254 – in review after this meeting. Not planning to move in Kona but in Portland. This issue clarifies an unevaluated operand is fully evaluated as if it occurred in an expression. Meredith asks if this will introduce pointers that be dereferenced in decltype expressions. Miller states they will have full semantic checks but no temporary is created. The semantics have to be obeyed, but there is no runtime behavior change
3. CWG 1340 – removing requirement that a member pointer dereference expression (i.e. $T.*$ or $T->*$) requires T to be a class type as no implementation requires this. This issue is in ready status

CWG also reviewed paper by Walter Brown which will be in post-meeting mailing.

Miller noted that CWG had a teleconference before meetings to maximize time at meetings by taking care of issues that require a trivial amount of work. CWG will have a teleconference in the early part of November. Miller asks for any questions from the room. There are none. Clamage thanks Miller and asks for a report from Meredith.

Library Working Group

Meredith reports LWG will have 18 issues in ready status and 20 in review. Meredith has concern that unknown direction of language makes it difficult to know what to work on next. LWG also looked at five paper for future library extensions: filesystem, shared_lock, permutations of partial elements of set, IO for duration types, and date

time. The date time proposal is the most controversial, but there is interest in looking into it further.

Concurrency Working Group

Crowl reports that three issues were moved to ready. The shared_mutex paper was presented with a bit of controversy. It will be worked through by Kona. There is nothing else actionable from other work.

7.2 Presentation and discussion of proposed responses to public comments. Straw votes taken.

Clamage announces there will be only one motion for tomorrow: the delegation for 2012. Clamage asks if there is any further business for today. Halpern asks what the schedule is for tomorrow. Clamage states that we will meet tomorrow morning at 8:30 a.m. and discuss future directions for the language. That discussion will be cut off at 11 a.m. to allow the meeting to close before lunch.

The group breaks up to meet in separate working group sessions.

Thursday 18 August 2:30 p.m. – 5:30 p.m.

8. WG sessions continue.

Friday 19 August 8:30 a.m. – 10:00 a.m.

9. ~~WG sessions continue~~ Plenary session to discuss future direction of language

Clamage calls meeting to order. He asks Sutter to lead the discussion. Clamage reminds the group that the discussion will be cut off at 11 a.m. to close the meeting.

Sutter starts the discussion off with slides and says, “I am looking forward to the comments from the group.” He congratulates the group. “We did it!” He also notes that the community is congratulating us as well. “There is a lot of interest in what the committee has done.” Last week at a conference in Banff, he received many comments and questions about what the committee would do next. “On the language side, how many of you would like the committee to invent new language stuff right away, one year out, or three years out?” Sutter asks the room. He roughly counts

hands where ‘right away’ received 40% of the vote, ‘one year’ received 50%, and ‘three years’ received 10%.

“The biggest weakness of C++ is lack of standard library. People are clamoring for more. Saying that Boost is available is not enough.”

“We should aggressively promote language extensions,” Sutter continues. “That is what I am going to talk about.” Sutter asks, “What have we learned?” He answers the question saying, “TRs have worked out well. Shipping a non-normative TR gives lots of freedom. Shipping a TR first allows easy change. Shipping a IS carries with it a heavy compatibility bar. This was felt with some C++99 features. The community would like a bigger standard library and a more predictable ship schedule. Eight years seemed long to the committee, it is even longer to those outside. Why can’t the committee ship on internet time scales?”

“One option is to adopt a ship train model. Proposals are accepted for a certain release up to a cutoff meeting. After that meeting new proposals are still accepted, but for the next release and not the current one. This does not prevent working on longer term features as they can continue work until the point they are ready to ship. Knowing that another ship train is coming is a nice pressure release valve. The biggest problem with 0x was feature creep—the mentality that if a feature does not get in now it never will. The now or never pressure makes adding stuff more urgent and creates tension in the committee. If the ship train model had been adopted for 0x the committee could have shipped two standards in the same time with the same content.”

Abrahams asks, “Will have TRs in progress at the same time as the working paper?”

“What are we going to do with the language?” Sutter replies. “If we take a cooling off period, then working on library TRs makes sense. If we do decide to add new core features, I doubt we will be done in three years.”

“Where does three years come from?” asks Abrahams.

“I was just throwing out a number. At two meetings a year that is two to three years.”

Clamage, Spertus, Meredith, and Vandevoorde queue for questions.

“With this mode we will have to carefully think about timescales,” says Clamage. “Fortran releases every three to five years. Vendors are three to five versions behind. If a new C++ standard came out every three years, we would need to check that our community can keep up.”

Sutter says, “Given Fortran as an example, we need to make sure to keep relevant. I am hoping we do not ship core changes every three years, but library additions every three years.”

“Just adding libraries that do not affect existing code would be fine,” says Clamage.

Spertus says, “A library release takes design, implementation, feedback, and then standard. How we can do a standard and a TR in three years?”

“All we do is open gates for proposals,” replies Sutter. “We don’t have to wait for the implementation. The vendors should already have them implemented.”

“You talked about TR for library and then standard,” says Spertus.

“Not talking about library and standard in three years,” says Sutter. “Not until Kona will we know about core extensions. For core features we do experimental things. TRs are the place for doing Avant-guard things. E.g. Concepts would make a great TR.”

Meredith, Abrahams, and Maurer queue for questions. Vandevoorde drops from queue.

Meredith asks, “Are we open for minor extensions in the language its self? E.g. the dynarray requires language extensions.”

“There are three ISO buckets: TR, standard revision, or technical corrigendum,” replies Sutter. “A TR is a non-normative technical report, issues are ratified, and implementations do not need to implement the TR to be standard conformant. Used to get feedback. TC is what we did in ’03. Only bug fixes. No new features. Our options are TC or add new features. Adding spliceability is a good TR before we do it on the std::map.”

Meredith asks, “Is it as much work to do a TC as a major revision?”

“The steps are the same, but there is less scrutiny,” replies Sutter.

Hedquist adds, “A TR is faster.”

Sutter says, “You can do a TC faster as there is less controversy: can have concurrent ballots.”

Meredith asks, “How is a TR faster?”

“It has fewer stages. A standard has CD, FCD, and FDIS. TRs don’t have FDIS,” replies Sutter.

Abrahams says, “I don’t have enough clear info to make any decision. I would like schedules to see what this would look like over next 10 years. Taking library as little slice is too piecemeal. Taking the next couple of steps on their own is too piecemeal.”

“So doing TR1 was too piecemeal?” asks Sutter.

“Yes,” says Abrahams. “TR1 was planned as strategy for getting to 0x. We had 10 years to fit that in. If we work at higher pace, that will require more coordination. How do we decide what next thing that goes out is? I like proposal for higher pace but do not have enough info to decide what to do.”

“Are all the trains leaving for another IS?” asks Maurer.

Sutter replies, “Not saying anything about IS, as I think we should do TRs like C did, focusing on library. If we target library ship in 2-3 years we can fold that into IS after that.”

“To clarify: Produce constant rate library TRs. At some point we decide to collect them all into standard,” says Maurer.

“Yes,” says Sutter. “This gives more flexibility than coming from CD.”

Maurer says, “We have experience with TR model with C++11. Don't know how core features fit into this.”

Crowl says, “What is effect of new DIS to the standard model IS? It will get out faster, but we don't want to put out incomplete markers.”

“We used it for special math,” says Sutter.

“But not C++0x,” replies Crowl.

“If we issues FCD and get no negative votes can go directly to ballot. Special math was the first every ISO standard to use it,” says Sutter.

Vandevoorde asks, “Do we have multiple states of working paper?”

“No,” says Sutter. “Makes sense if libraries do not build new language papers. Don’t want to maintain several working papers at same time.”

“Doing TRs on top of working papers; it is painful to work with,” says Vandevoorde.

“Our decision making process will not change,” says Nelson. “It works by consensus. Going to model like this does not tie our hands later. The key change is publishing at a smaller granularity. 0x was massive! Absolutely massive! This will publish things bit by bit instead of working for last feature.”

Meredith says, “I see two discrete trains running serially. Can we work on next when one is going through balloting process? There is a concern that library did feature design that was tweaked after core changed things. Should we parallelize? Or is that crazy?”

“Good question,” says Sutter. “We had several things going at once: modules bucket, TR2. We paused on those as it was too much at once. To answer can we do things in parallel, we can be working on progressing whatever we want, but it just gets on the next ship train. The proposal refinement is decoupled from bucketing to ship.”

Spertus says, “Concern is more from core perspective. Daveed’s question is apropos. We will be applying fixes for found bugs to working paper. There is a practical problem with specifying what goes into TR when base document is changing even if only fixing bugs. A large part of core is seeing how old wording applies to what is the state of the document now. A problem with this model is that the working paper will be changing despite TRs based on it. I Like TRs but would like TC out in good time. There are three TC from C since 99.”

“When I agreed with Daveed about multiple parallel drafts,” says Sutter, “I was thinking of language features. DRs are parallelizable with libraries. More concerned with two forks doing core extensions, was not proposing that. Unless we see a big desirable feature, like concepts, that involves both. Then we will have to be careful. That is the first what is second question?”

“Frequency of TCs?” says Spertus.

“Think we should get TC out soon,” says Sutter.

“Would like to get TC out sooner than 2003,” says Spertus.

“Yes please,” says Abrahams.

“I am all up for core targeting TC in 3 years while library is working on TR,” says Sutter.

Halpern says, "Need coherent plan that cannot be worked through in plenary session. What if we could put out a feature to the world like Clark said. Daveed said it was difficult to work with a patch. What was painful about that? Could we mitigate that? No way to work around parallel work; can't have both wordings in working paper at same time. New library features are easy ones. Change to library is harder. Change to language harder still."

"As far as C the TR models was successful," says Sutter. "The problem with C was they did TRs for too long; did it for a decade."

Maurer says, "When we did TC1 we decided to release a new version of the standard."

"We added features in 03?" asks Sutter.

Many in the room reply, "Yes."

"Well it snuck by a lot of us," says Sutter.

Maurer asks, "Can't we work off patches for an extended period of time?"

Crowl replies, "Isn't that what source control is for?"

"Think about interactions rather than text differences," says Sutter.

Maurer asks, "Is ISO concerned with new IS in fast time frame?"

"We are SC22s most active working group," says Sutter. "It would be nice if we did not keep asking for standard. We could ship as soon as every two years."

"Can we publish an invitation for proposals at this meeting?" asks Maurer.

"I think Library is planning on it," says Sutter. "Core needs to decide. Elephant in the room is do we accept language extensions?"

Plauger says, "In practice two years will get push back from NBs. But it is not possible with this committee to do this with two meetings a year, and I am not advocating increasing schedule. Committee has not learned discipline for quick turnaround. Three to four years. If we promise to do more than that we will fail."

"The driving published date is no new feature date," says Sutter. "Once we did that we shipped in fixed amount of time. That was true for 0x and TR1. Once we said that this meeting is the last for accepting proposals it happened."

“Agree,” says Plauger. “Nevertheless, with turnaround time, the full cycle time cannot be too fast.”

Hedquist says, “It is not inconsistent to work on TCs and extensions at same time; can publish paper whenever you are ready.”

Meredith says, “At some point the language will become too big to be extended. Core doing a little work could cause lots of revision. Perhaps we should think of having separate IS for things like networking.”

“There is a fundamental difference between library and core,” says Sutter. “Adding networking library is easy. I keep talking about library as it is more needed and it is easier. Bjarne gave speech for goals for C++0x: aggressive library minimal core. We are competing with the Java standard library from 15 years ago. We are not a design team, but we want to go faster.”

Halpern says, “Go back to date for wanting to succeed. Is there a date before paper cutoff date that is more important? What is the definition of new feature? People said that it is a new feature but it is incomplete without it. There was a refinement of new feature that got in.”

“The first date is when we stop accepting proposals,” says Sutter. “The second period is to complete the features. If the second is IS there will be much more time spent discussing it.”

“Not sure question is answered,” says Halpern.

“First is for new proposal for garbage collection, formats, concepts, etc.,” says Sutter. “Second is to refine the library and discuss how those interact.”

“ISO does not get upset if we add more to FDIS just before releasing?” asks Halpern.

“We can break almost any rule in ISO if the national bodies stand for it,” says Sutter. “If we see newspaper articles about it then we should get worried.”

Meredith says, “Concern is that the time to stop features is bullet 1. We need to stop as we load the train up. What happens with something like noexcept that comes up at the end?”

“noexcept is a good example as it was a language feature so it had more effect,” Sutter says.

Dennett says, “The new features do not play as well if there is no integration phase. Is there any sense for how to get the standard to feel like a coherent unit?”

“We pulled features from TR2 (like datetime) to make a cohesive unit,” says Sutter. “Language is harder, but tried very hard and it worked well.”

“How do we do a better job of integration?” asks Dennett.

“With first few clauses it requires heroic effort,” says Sutter.

Crowl says, “There are some things that core could do as TR. Poster child is modules. Will have some integration with exiting text but it should be doable as separate text.”

There are no further questions or comments from the room. Clamage proceeds with closing.

10. Review of the meeting

10.1 Motions

No formal motions.

Additional Motions

Du Toit moves to thank the host. Applause ensues.

10.2 Review of action items, decisions made, and documents adopted by the committee

Meredith asks for review of a call for papers LWG came up with yesterday. Clamage puts it on the screen and asks if the room is in agreement. Clamage asks the secretary if the proposal will make it into the minutes. Kloepper says it will. Here is the statement:

The C++ committee Library Working Group welcomes proposals for library extensions which will be considered starting in the February 2012 meeting. We have not yet set out an overall timeline for future library extensions, but are ready to consider new proposals at this point.

To increase the chances of your proposal being accepted by the committee, we strongly recommend that a committee member willing to champion your

proposal (this could be you yourself or a delegate) attend upcoming meeting to help shepherd your proposal through the process.

10.3 Issues delayed until today.

Clamage reported that there were no issues delayed until today.

11. Plans for the future

11.1 Next and following meetings

Sutter presents the meeting schedule for upcoming meetings:

- 6-10 February 2012: Kona, Hawaii, USA – Sponsored by Plum Hall and Bloomberg
- September 2012 (estimated): Portland, Oregon, USA – Sponsored by Intel
- Spring 2013 – TBD
- Fall 2013 – Chicago, Illinois, USA – Sponsored by DRW Trading Group
- Spring 2014 – TBD
- Fall 2014 – Urbana-Champaign, Illinois, USA – Sponsored by University of Illinois at Urbana-Champaign

Meredith asks if these will be five day meetings. Sutter says yes they will be five day meetings. Meredith comments that we are halving our work with five day meetings and may need to move back to six day meetings, but he is not proposing that we do so now. Nelson says the solution is to have teleconferences. Sutter also suggests extra face to face meetings of sub-groups.

11.2 Mailings

Nelson reviewed the following mailing deadlines:

- Post-Bloomington: 2 September 2011
- Pre-Kona: 13 January 2012

12. Adjournment

Clamage will entertain motion to adjourn.

Nelson moves to adjourn. Brown seconds.

The meeting adjourns at 09:57 (UTC-5) Friday 19 August 2011.

Attendance

Company/Organization	NB	Representative	Mon	Tue	Wed	Thu	Fri	Sat
Apple		Howard E. Hinnant	V	V	V	V	V	
Apple		Doug Gregor	A	A	A	A	A	
Bloomberg		John Lakos	V	V	V	V	V	
Bloomberg		Alisdair Meredith	A	A	A	A	A	
Bloomberg		Dietmar Kühl	A	A	A	A	A	
BoostPro Computing		David Abrahams	V	V	V	V	V	
BoostPro Computing		John Wiegley	A	A	A	A	A	
Carnegie Mellon University		David Svoboda	V	V	V	V	V	
Dinkumware		P. J. Plauger	V	V	V	V	V	
Dinkumware		Tana Plauger	A	A	A	A	A	
Edison Design Group		Jens Maurer	A	A	A	A	A	
Edison Design Group		William M. Miller	A	A	A	A	A	
Edison Design Group		Daveed Vandevoorde	V	V	V	V	V	
Fermi Nat. Accelerator Lab		Walter E. Brown	V	V	V	V	V	
Fujitsu Laboratories of America		Maarten Wiggers	V	V	V	V	V	
Gimpel Software		James Widman	V	V	V	V	V	
Google		Lawrence Crowl	V	V	V	V	V	
Google		James Dennett	A	A	A	A	A	
IBM	CA	Michael Wong	V	V	V	V	V	
Indiana University		Andrew Lumsdaine	V	V	V			
Indiana University		Jeremiah Willcock	A	A	A	V	V	
Indiana University		Larisse Voufo	A	A	A	A	A	
Indiana University		Marcin Zalewski	A	A	A	A	A	
Intel		Clark Nelson	V	V	V	V	V	
Intel		Pablo Halpern	A	A	A	A	A	
Intel	CA	Stefanus Du Toit	A	A	A	A	A	
Microsoft		Herb Sutter	V			V	V	

Company/Organization	NB	Representative	Mon	Tue	Wed	Thu	Fri	Sat
NVidia		Olivier Giroux	A	A	A			
Oracle		Stephen D. Clamage	V	V	V	V	V	
Perennial	US	Barry Hedquist	V	V	V	V	V	
Plum Hall		Thomas Plum	V	V				
Programming Research Group		Christof Meerwald	V	V	V	V	V	
Red Hat		Jason Merrill	V	V	V	V	V	
Red Hat		Benjamin Kosnik	A	A	A	A	A	
Riverbed Technology		Kyle Kloepper	V	V	V	V	V	
Riverbed Technology		Neal Meyer	A	A	A	A	A	
Roundhouse Consulting		Pete Becker	V	V	V	V	V	
Seymour		Bill Seymour	V	V	V	V	V	
Symantec		Mike Spertus	V	V	V	V	V	
PL22.16 Non-members								
HSR	CH	Peter Sommerlad	N	N	N	N	N	
LTK Engineering		Alan Talbot	N	N	N	N	N	
University Carlos III	ES	J. Daniel Garcia	N	N	N	N	N	
Vollmann Engineering	CH	Detlef Vollmann	N	N	N	N	N	
	FI	Ville Voutilainen	N	N	N	N	N	
	UK	Roger Orr	N	N	N	N	N	
Full Life Financial LLC		Keith Newcomb	N					
Eagle Glimpse		Daniel Heath	N	N	N	N	N	
BLDL, UNIV. OF BERGEN	NO	Magne Haveraaen	N	N	N	N	N	