

ISO/IEC JTC 1/SC 22/WG 9 N591

Meeting Minutes

Meeting #74 of ISO/IEC JTC 1/SC 22/WG 9

Friday 22 June 2018, Lisbon, Portugal

In accordance with Resolution 73-2, meeting #74 was held the morning of Friday, 22 June 2018 in Lisbon, Portugal, in conjunction with [Ada Europe 2018](#). The meeting was held in the Diamante 2 Room at the conference venue. The meeting started at 09:45 (WEST).

The detailed agenda was distributed as [N588](#).

Remote access to the conference was available via WebEx.

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Opening Orders

Call to Order

Appointment of Meeting Secretary

Welcome and Administrative Arrangements

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Approval of [N585](#): Meeting #73 Minutes. (Resolution 74-1)

Reports and Introductions

Canada – Brad Moore (HOD)

Canada was an active participant at the recent IRTAW 19 held in Benicàssim, Spain on April 18-20, 2018, where Brad Moore had the role of Program Chair, and Jorge Real was the Workshop Chair. The IRTAW workshop discussed a broad set of topics, which were covered by seven different sessions.

The following are the main session topics that were discussed at the workshop:

- Parallel Programming Issues;
- Multiprocessor Locking Issues;
- Language Profiles;
- Time Triggered Scheduling for Ravenscar;
- Deadline Floor Protocol Issues;
- Language Issues; and
- Clock Issues

The workshop included participants from Canada, Italy, Norway, Portugal, Spain, and the United Kingdom.

Under the topic of Parallelism, we reviewed the current parallelism proposals proposed for Ada 202x, and then discussed OpenMP and how it could be integrated with Ada, and what additional benefits that might bring. OpenMP has certain features that are beyond what is currently proposed for Ada 202x, such as unstructured parallelism, as well as some support for heterogeneous architectures.

Under the topic of Multiprocessor Locking issues, we reviewed a comparison between MrsP and MSRP, which are two proposals currently being considered. The group felt it would be premature to attempt standardization of these, we did realize that Ada is lacking in defining an ordering for obtaining multiprocessor locks. The language currently says that there is no defined order, whereas protocols such as these two require a FIFO ordering, which is also more deterministic. As a result, a new AI was created, AI12-0276-1 Admission Policy Defined for Acquiring a Protected Object resource.

Under the topic of Profiles, we reviewed a proposal that allows Ada tasks to execute on small MCUs, with very limited memory. The idea is to have all tasks sharing the same stack space, with no local state in each task. There are some issues to be worked out still, but the idea seems very promising, and could potentially bring Ada tasking to new platforms. It was noted that the Non-Preemptive scheduling policy in Ada would likely be a good choice to use with this profile. We then examined the Non-Preemptive profile to see how well it would support this notion, and noticed an issue that there is not enough preemption points in the policy. The policy says the preemption points occur when blocking occurs, but if an entry is open, or a suspension object needing to wait on its event, then a preemption point does not occur because blocking does not occur. It was realized that the preemption points should be defined in terms of potentially blocking instead of blocking.

AI12-0279-1, Non-preemptive Dispatching Needs more Dispatching Points was created to deal with this issue.

We then discussed a study on comparing Ravenscar EDF vs Fixed Priority Scheduling. The work is ongoing, but early indications are that some findings contrast with earlier results of a different study. We look forward to seeing the results of this study.

Under the topic of Time Triggered Scheduling, we discussed a proposal for Ravenscar. The scheme seems very flexible, but more thought is needed to work out some details, and to consider whether this should be standardized, or a framework that can be applied to a system.

Another point raised was to consider a repository for third party contributions, such as the Time Triggered scheduling libraries of Jorge Real, Sergio Sáez, and Alfons Crespo, or the Paraffin libraries of Brad Moore, or the Clock and Timer libraries of Kristoffer Gregertsen. We reached a unanimous consensus that this would be a good idea. We agreed that the top level package name for this could be XAda, and that it should be publically available in a repository such as git-hub. The thought was that this would be a good way to bring the community to a common place, as well as encourage people in the community to contribute their own ideas.

Under the topic of the Deadline Floor Protocol, we discussed various issues with the protocol, and Alan Burns gave an overview of how the protocol has been evolving to address these issues. He was encouraged to hear that this AI was being considered to make the cut for the new features in Ada 202x, so he progressed the AI with a new update for ARG consideration.

We then discussed real-time issues with respect to the Ada 202x standard. There were three AIs listed that were of interest to the real-time community.

- AI12-0139-1 Thread Safe Language-Defined units
- AI12-0230-1 Deadline Floor Protocol
- AI12-0234-1 Compare and Swap for Atomic Objects

The group agreed that atomic compare and swap, and related utilities such as atomic increment should be added to Ada, as these are useful for creating lock-free algorithms. As a result of progressing AI12-0234-1, it was realized that generic formal types need to allow being specified as having the Atomic aspect. To provide this capability, AI12-0282-1 Atomic and Volatile generic formal types was created.

We also discussed whether the CPU aspect should be allowed to be specified on a protected object, because if all use of a protected object is by tasks executing on the same CPU, then locking is not needed. As a result of this discussion, AI12-291-1 CPU affinity for Protected Objects was created.

The final session was on Clock Issues. It was noted that Ada is falling behind other languages with capabilities in this area. It was realized that better clock synchronization is needed, as well as wall clock support with the Ravenscar profile. The ideas of this proposal are still being developed, and might become available in the aforementioned XAda repository.

Overall the IRTAW workshop was very productive and deemed a success. The group thanked Jorge Real for providing the local arrangements in the scenic locale. Thanks also to the sponsors of the event, AdaCore, Ada Europe, DISCA, and Universitat Politècnica de València for contributing to the success of the event.

We are planning to hold the next IRTAW, IRTAW 20, in 2020, on April 20, back in Benicàssim, Spain. We encourage people to plan to join the workshop.

Italy – Tullio Vardanega (HOD)

Portugal – Luis Miguel Pinho (HOD)

Currently Portugal is an O member of SC 22, and WG 9 is the only WG active in SC 22 in the country. The main focus of the technical work continues to be in the parallelism extensions being proposed for Ada, including compatibility with OpenMP.

Spain – Juan Antonio de la Puente (HOD)

Spanish members of the HRG participated in the IRTAW 19 meeting, which was held in Benicàssim on April 18-20, 2018.

The Spanish NMO SC 22 mirror committee annual meeting was held on April 20, 2018. An issue was raised with the intent of UNE, the Spanish ISO member, to impose fees on organizations participating in ISO activities such as SC 22/WG 9. There is concern that some relevant organizations may withdraw their support. Negotiations are under way to try to reduce or remove such fees.

A meeting of the Spanish WG 9 mirror group was held on May 29, 2018. The Ada 2020 AIs were reviewed by the participants, without any further significant comments.

The Spanish delegation for this meeting of WG 9 is Juan Antonio de la Puente (HOD).

Switzerland – Nicholas Kaethner (HOD)

UK – Jeff Cousins (HOD)

Activity of the UK NB's Ada Panel consisted of the occasional e-mail correspondence, and reporting the overall progress of the AIs.

The UK delegation is John Barnes, Alan Burns (electronically for the real-time AIs), and Jeff Cousins (HOD) for this meeting of WG 9.

USA – ? (HOD)

Guests – ?

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Liaison Reports and Introductions

Ada Europe – Dirk Craeynest

Ada-Europe would like to inform the WG9 convenor that it will send a 2-person Ada-Europe liaison delegation to Meeting #74 in Lisbon, Portugal, on Friday 22 June 2018.

The delegation consists of:

- Erhard Ploedereder
- Dirk Craeynest (presenter)

The next Ada-Europe conference [1] will be held on June 10-14, 2019, in Warsaw, Poland, and we reconfirm our usual hospitality agreement for WG9, ARG and HRG, as well as for WG23. The preliminary Call for Contributions (pCfC) will be available on the conference web site shortly.
[1] <http://www.ada-europe.org/conference2019>

We reconfirm our willingness to support the Ada standardization and related activities.

Ada-Europe is happy to report a healthy situation with the Ada User Journal (AUJ) [2]. Four issues are published each year. Reports on the Ada standardization process are planned to be periodic. The Journal continues printing material from the industrial track of the Ada-Europe conference, as well as reports of the International Real-Time Ada Workshops. The Journal provided the proceedings of the Workshop on Challenges and New Approaches for Dependable and Cyber-Physical Systems Engineering (DeCPS 2017), co-located with Ada-Europe 2017, and plans to publish this year the proceedings of the two workshops co-located with Ada-Europe 2018. The AUJ also continues with its traditional Quarterly News Digest, Conference Calendar and Forthcoming Events sections.

A special mention is the increased collaboration with ACM SIGAda: the most recent Ada Letters issue included a reprint of 3 articles from recent AUJ issues. Next plans include the simultaneous publications of the proceedings of the Real-Time Ada Workshop in June, and Ada Letters to further reprint AUJ papers in the December issue.

[2] <http://www.ada-europe.org/auj>

SIGAda – Drew Hamilton

WG 23 – Erhard Ploedereder

Summary:

Unfortunately I missed the Lexington WG9 meeting, so that this report covers the period since the Vienna WG9 meeting.

Since then, WG23 held five multi-day face-to-face meetings: Vienna, June 19-20 (with SC 22), London, August 16-17, Albuquerque, Nov 7-8 (with WG21), Phoenix, Jan 22-23, Brno, April 26-27 (with WG14), Rapperswil, June 6-8 (with WG21), and interim two-hour teleconferences before and after the main meetings. In the face-to-face meetings adjacent to other WG meetings, the

main topics were the respective language parts of TR 24772. The meetings without other WGs mainly served to complete the work on Part 1 of the TR.

WG23 is getting ready to put Part 1, 2, and 3 of the document out for standardization votes: WG23 hopes that WG9 finalizes Part 2 here in Lisbon and thanks WG9 for its efforts in updating the old Annex to become Part 2 of TR-24772. WG14 is expected to finalize Part 3 at its next meeting. Part 1 is ready but for a few editorial changes involving missing references, so that a package of three parts can go to ISO for voting, completing upcoming deadlines of delivering work items on the WG23 program.

WG23 hopes that WG9 helps in organizing the writing of the SPARK Part of the TR.

Subgroup SG12 (“undefined behavior”) of WG21 has been involved in writing the C++ Part. With the C part as starting point, the first few sections have been drafted in detail to match the C++ situation, dealing with the various vulnerabilities that center around buffer overflows, index violations, and invalid pointer values.

Updating the Python and Fortran Annexes is still undecided, since experts are needed but not available or not yet identified. The Ruby and PHP Annexes receive less priority and thus are likely to not be updated.

Part 1 has been polished editorially; major contents have not changed in 2018 except that Part 1 received a first entry in its section 8, which contains vulnerabilities to be integrated into section 6 of the next (4.) Edition of the TR without expectations that language-specific Parts written to the 3. Edition deal with it already.

A meeting schedule has been mapped out for the next year at about the same intensity as in 2017/18. As usual, the face-to-face meetings will have pre- and post-TeleCons. Interested parties should contact Stephen Michell or Erhard Ploedereder.

Fortran, INCITS/PL22.3 – Van Snyder (apologies)

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Convenor's Report Activities since the Last Session

The Convenor (amongst others) offered WG9 expertise in the effort to develop the CERT Secure Coding guidelines. The contact, Robert Schiela (rschiela@cert.org), Technical Manager of the Cyber Security Foundations in the CERT Division of the SEI, indicated it was a casual effort that they hope to initiate in the spring. He promised to contact us when they begin.

Meeting Objectives

The major objectives for this meeting are:

1. Current Technical Reports status
2. WG 9 Meetings
3. IRTAW Results
4. Ada Issues and Ada 202x Amendment Scope document
5. Develop Technical Reports or Standards improving the Ada libraries
6. Consider proposals for extending the language

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Project Editor Reports (as needed)

IS 8652 (Information Technology--Programming Languages - Ada) (Jeff Cousins, Randy Brukardt)

IS 15291 (ASIS) (Bill Thomas, Greg Gicca)

TR 15942 (Guidance for the Use of Ada in High Integrity Systems) (Ben Brosgol)

IS 18009 (Conformity Assessment of an Ada Language Processor) (Erhard Ploedereder)

No activities to be reported

TR 24718 (Guide for the Use of the Ravenscar Profile in High Integrity Systems) (Alan Burns)

Work is underway to adapt the report to the ISO requirements. The revision is intended to be complete prior to the October WG 9 meeting.

TR 24772-2 (Guidance to avoiding vulnerabilities in programming languages – Vulnerability descriptions for the programming language Ada) (Joyce Tokar)

The editor has participated in several meetings with WG 23 to move this document along in the standardization process.

Thanks to various members of the HRG and members of WG 23, the editor was able to generate a new version of TR 24772-2 to address changes and modifications in the parent document, TR 24772-1.

A new version of TR 24772-2 was distributed to WG 9 on 07 June 2018 with the following editorial changes:

- The new document number is N0805 and date is 8 Jun 2018.
- All of the Guidance to language users sections now begin with the statement “Follow the mitigation mechanisms of subclause 6.3.5 of TR 24772-1.” Except section 6.27, where the language in Part 1 is Not Applicable. When this is the only statement in the section, it appears as a sentence. When there are additional items, this is the first bullet of a bulleted list.
- The following Guidance to language users has been moved into Part 1, and therefore, eliminated from the Ada Part:

Section 6.6.2

- Always respect the implied unit systems, when converting explicitly from one numeric type to another.

This was added to Part 1, and removed from Part 2.

Section 6.9.2

- Do not suppress the checks provided by the language.

This was added to Part 1, and removed from Part 2.

Section 6.24.2

- ~~Keep expressions simple. Complicated code is prone to error and difficult to maintain.~~

This item was deleted as it is a restatement of a bullet in 6.24.5 in Part 1.

Section 6.35.2

- Alternatively, monitor the depth of the recursion such as by passing a recursion depth value that is incremented for each level of recursion, and use a subtype constraint or explicit comparison against a maximum depth limit to trigger handling of the situation.

This was added to Part 1, and removed from Part 2.

Section 6.44.2

- Precede downcasts by a class-wide membership test as needed to avoid possible exceptions.
- Use type invariants where allowed to detect semantic violations caused by upcasts.

These were added to Part 1, and removed from Part 2.

Section 6.52.2

- Do not suppress language defined checks.

This was added to Part 1, and removed from Part 2.

- If language-defined checks must be suppressed, use static analysis to prove that the code is correct for all combinations of inputs.

This was already in Part 1, it has been removed from Part 2.

- If language-defined checks must be suppressed, use explicit checks at appropriate places in the code to ensure that errors are detected before any processing that relies on the correct values.

This was added to Part 1, and removed from Part 2.

Section 6.55.2

- For situation where order of evaluation or number of evaluations is unspecified, use only operations with no side-effects, or idempotent behaviour, to avoid the vulnerability.

This was added to Part 1, and removed from Part 2.

Section 6.57.2

- Minimize use of predefined numeric types whose ranges and precisions are implementation defined. Instead, use types whose ranges and precision are guaranteed.

This was added to Part 1, not in Part 2.

Section 6.60.2

- Where possible do not use forced termination.

This was added to Part 1, and Part 2 was modified.

Section 6.63.2

- On a single processor, make use of a scheduling regime based on ceiling protocols, this is guaranteed to be deadlock free (if the tasks and resources are assigned the correct priorities – a static property that can be checked offline).
- For multicore, consider assigning all interacting tasks to the same CPU then treat each such group as a separate independent entity.

- Minimize the use of dynamic priorities and dynamic ceiling priorities (so that the static values can be verified)

This was added to Part 1, and removed from Part 2.

Section 6.61.2

- Use **pragma Atomic** and **pragma Atomic_Components** to ensure that all updates to objects and components happen atomically.
- Use **pragma Volatile** and **pragma Volatile_Components** to ensure that all tasks see updates to the associated objects or array components in the same order.

These were moved from section 6.3.2 as they are more appropriate to the vulnerability described in this section and were not applicable to 6.3.

Section 6.63.2

- Make use of loosely coupled, ~~non-blocking~~ communication using protected objects.

“, non-blocking” was deleted from this sentence as it is bogus! Of course protected objects are blocking, how else would mutual exclusion be supported!

- Section 8

Added the hyperlink for 6.38 Deep vs. Shallow Copying [YAN]

- Updated the Index and Table of Contents.

Seeing as these changes are editorial, the editor would like WG 9's approval to forward this TR to WG 23 for acceptance and publication.

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Rapporteur Group Reports (as needed)

Rapporteur Report ARG

The Ada 2012 standard has so far (posted by 15 June 2018) generated 284 Ada Issues (AIs).

The ARG met in Lexington, Massachusetts, U.S.A. in October 2017, following a WG 9 meeting which had approved twelve AIs.

Two regular and twelve amendment AIs were not discussed as they were awaiting action completion, eleven amendment AIs were not discussed as we ran out of time (all of low or very low priority), and twelve amendment AIs were not discussed as they were expected to end up as no action.

Three regular AIs were approved (two with minor changes).

Two amendment AIs were approved (with minor changes), seven had their intent approved, five require further investigation, and two were rejected as no action.

There was a notable reduction in the number of “regular” AIs (i.e. corrections to or clarifications of the existing standard), allowing the meeting to concentrate on the proposed amendments. A major item of discussion was again the proposal for greater parallelism (and the accompanying proposal for annotating subprograms with the global values used so that parallelisation may be performed safely). Given the preceding, and occasionally heated, e-mail discussions, there was

a pleasantly surprising level of agreement (though there were more animated e-mail discussions subsequently!).

The AI incurring the longest discussions was the proposal for syntax to provide a simpler method for updating just a part of an aggregate; this was narrowly passed.

Three further meetings were held by phone/video conference, one each in January, March and April 2018. These were very productive: thirteen regular AIs were approved (all but one with minor changes), eleven amendment AIs and one ramification AI had their intent approved, and two were rejected as no action.

Two votes were then held to help prioritise the amendment AIs. One vote split them approximately 50:50 between AIs for 2020 and AIs to 'hold' until a future edition. This allowed an Ada 2020 Scope document to be produced for WG 9, listing those Amendment AIs that we hope to include (this includes those already approved). The other vote prioritised the 'simple' AIs, to assist in the running of face-to-face meetings.

As of 15 June 2018, 159 AIs had been approved by WG 9 (100 having already made it into the Corrigendum), 20 by the ARG but not yet by WG 9, and 59 are work items for discussion at the ARG. Of the 59, 3 are binding interpretations and 56 are amendments, 31 of which have yet to be discussed at a meeting. (There is also one AI on presentation).

A number of AIs have completed editorial review and are be ready for approval by WG 9. The list follows. As usual, the full text of the AIs can be found at www.ada-auth.org/ais.html.

AI12-0064-2/16	2018-05-07	--	Nonblocking subprograms
AI12-0075-1/11	2018-05-07	--	Static expression functions
AI12-0127-1/16	2018-05-07	--	Partial aggregate notation
AI12-0187-1/08	2018-05-07	--	Stable properties of abstract data types
AI12-0211-1/04	2017-11-17	--	Interface types and inherited nonoverridable aspects
AI12-0220-1/06	2018-05-07	--	Pre/Post for access-to-subprogram types
AI12-0232-1/04	2018-04-13	--	Rules for pure generic bodies
AI12-0233-1/05	2018-04-13	--	Pre'Class for hidden operations of private types
AI12-0241-1/02	2018-01-18	--	Specifying Nonblocking for Language-Defined Units
AI12-0244-1/02	2018-01-29	--	Check name for Value attributes
AI12-0247-1/01	2018-01-18	--	Potentially Blocking goes too far for Detect_Blocking
AI12-0252-1/02	2018-01-29	--	Duplicate interrupt handlers under Ravenscar
AI12-0254-1/03	2018-03-06	--	Bounded_Indefinite_Holders
AI12-0258-1/04	2018-04-26	--	Containers and controlled element types
AI12-0259-1/02	2018-03-05	--	Lower bound of strings returned from Ada.Command_Line
AI12-0260-1/04	2018-03-06	--	Functions Is_Basic and To_Basic in Wide_Characters.Handling
AI12-0261-1/04	2018-05-07	--	Conflict in "private with" rules
AI12-0264-1/03	2018-04-26	--	Overshifting and overrotating
AI12-0265-1/03	2018-04-26	--	Default_Initial_Condition for types
AI12-0269-1/04	2018-04-26	--	Aspect No_Return for functions reprise

Work on the ASIS standard remains paused.

Future meetings are scheduled for 22-24 June 2018 in Lisbon, Portugal, in conjunction with the Ada-Europe 2018 conference, and provisionally for October or November in Boston or Lexington, Massachusetts, U.S.A..

Rapporteur Report HRG

The update of the charter of the HRG has been approved. This update revises the meaning of the acronym HRG from Annex H Rapporteur Group to the Ada High-Integrity Rapporteur Group. The content of the charter captures the new work that has been taken on in generating the Vulnerability Report for Ada and to consider other technical reports that may be needed to support developments in other standards.

The revision to TR 24772-2, Vulnerabilities Ada Part, required some editorial changes to be acceptable to WG 23. This version is completed and distributed to WG 9 for approval. Once WG 9 approves this document it will be forwarded to WG 23 for publication.

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Open Action Items and Unimplemented Resolutions

This is the "To Do" list for WG 9. Some are informal action items assigned to various participants. Some are formal resolutions, which are not yet implemented. Some items are simply in suspense awaiting action by other groups.

AI-70-4: Ben Brosgol will produce an initial draft update to TR 15942, Guide for the use of the Ada programming language in high integrity systems, by May 2018.

Status: Open

Discussion: The existing text from the Ada 95 version has been ported to Sphinx/rst, but the technical work on the revision remains fully to be done. Ben's schedule has prevented him from making progress and, moreover, he will be unable to participate further. AdaCore might still be able to find someone to take over Ben's role but that is yet to be determined. See AI-74-2 for the resulting action.

AI-73-1: Tullio to contact the Switzerland HOD (Nicholas Kaethner) to verify active role.

Status: Closed

Discussion: We received assurance of future interest in participating from Nicholas, particularly via WebEx.

AI-73-2: Pat to contact Drew Hamilton, new head of SIGAda, as replacement for David Cook.

Status: Closed

Discussion: Drew is happy to serve.

AI-73-3: Tucker to check whether 6.65 of TR 24772-2 requires a modification to the document.

Status: Closed

Discussion: The WG resolved by email ballot ([N586](#)) that Technical Report 24772-2 will be forwarded to WG 23 for acceptance and publication. Resulting edits are available for review.

AI-73-4: Joyce to revise the HRG charter by the June 2018 meeting.

Status: Closed

Discussion: The revised charter has been approved and is available in the document log as [N589](#).

AI-73-5: The ARG will consider revising the ARG charter.

Status: Closed

Discussion: The revised ARG charter is available as document [N584](#).

AI-73-6: Randy to ensure Steve Baird and Joyce are on the WG9 list, and verify Joyce rejoined.

Status: Closed

Discussion: Accomplished

AI-73-7: Tucker will encourage Florian to make progress on AI-71-1.

Status: Closed

Discussion: Tucker will contact Florian re: availability under AI-74-4

AI-73-8: Tullio will move TR 24718 forward with the required changes per ISO, and ask for help if needed.

Status: Open

Discussion: Pat to take over the AI for the MS Word formatting parts.

AI-73-9: Tucker will get the final dates for the Boston meeting in 2018.

Status: Closed

Discussion: Determined by ARG meeting Friday afternoon. (The next meeting will be held on 22 October 2018 in the Lexington AdaCore office.)

[AGENDA](#)

Committee as a Whole

Preliminary Scope for Ada 2020

- The proposed preliminary scope document was disseminated via email but was intended for meeting #75, subsequent to this meeting (#74, in Lisbon). As a result no further consideration was given to the proposed scope document itself.
- Consideration for an extended Ravenscar-based Profile

Miscellaneous

Note that David Keaton is the new SC 22 convenor.

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Unfinished Business

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New Business

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Scheduling of Future Meetings

The next meeting will be held on 22 October 2018 in the Lexington AdaCore office.

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Review of New Action Items

AI-74-1: Pat to contact relevant parties within AdaCore re: SPARK part of TR 24772-2.

AI-74-2: Pat to follow up with AdaCore for a person re: AI-70-4 to act as leader of revision of TR 15942. Ada Europe is willing to partially fund it.

AI-74-3: Pat to submit the AIs for the proposed Ravenscar extended profile.

AI-74-4: Tucker to contact Florian regarding his future availability.

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Final Consideration of Resolutions

[AGENDA](#)

Resolution 74-1: The meeting minutes of meeting 73 contained in document [N585](#) are approved.

This resolution passed unanimously.

Resolution 74-2: The next meeting of WG 9 will be held at 9am the morning of 22 October, 2018, in the Lexington office of AdaCore.

This resolution passed unanimously.

Resolution 74-3: The editorial changes to TR 24772-2 are approved.

This resolution passed unanimously.

Resolution 74-4: The HRG revised charter is approved.

This resolution passed unanimously.

Resolution 74-5: The ARG revised charter is approved.

Resolution 74-6: The AIs presented to WG 9 for approval are approved.

This resolution passed unanimously.

Resolution 74-7: The motion to include the topic of an extended Ravenscar-based profile to the Preliminary Scope for Ada 2020 is approved, based on the currently implemented GNAT profile.

This resolution passed with 10 votes in favor, two abstentions, and no votes against.

Resolution 74-8:

ISO/IEC JTC 1/SC 22/WG 9 continues the Ada High-Integrity Rapporteur Group (HRG) until the next plenary meeting and expresses its grateful appreciation to the Rapporteur and the members for their continuing service.

Joyce Tokar is continued as Rapporteur.

The membership of the HRG is designated to be: Steve Baird, John Barnes, Ben Brosgol, Alan Burns, Rod Chapman, Gary Dismukes, Bob Duff, Michael Gonzalez Harbour, Stephen Michell, Brad Moore, Miguel Pinho, Erhard Ploedereder, Juan Antonio de la Puente, George Romanski, Jean-Pierre Rosen, S. Tucker Taft, Joyce Tokar, and Tullio Vardanega.

The Convenor of WG 9 is authorized to act for WG 9 between meetings in appointing additional members of the HRG. In doing so, he shall consult with the Rapporteur and the National Body or Liaison Organization nominating the member.

Rapporteurs are permitted to allow other individuals to observe the deliberations of the Rapporteur Group. The admission of observers and the extent of participation permitted to observers are at the discretion of the Rapporteur with the concurrence of the membership of the Rapporteur Group.

This resolution passed unanimously.

Resolution 74-9:

ISO/IEC JTC 1/SC 22/WG 9 continues its Ada Issues Rapporteur Group (ARG) until the next plenary meeting and expresses its grateful appreciation to the Rapporteur and the members for their continuing service.

Steve Baird is appointed as Rapporteur.

The membership of the ARG is designated to be: Raphaël Amiard, Steve Baird, John Barnes, Randy Brukardt, Alan Burns, Peter Chapin, Jeff Cousins, Gary Dismukes, Robert Duff, Pascal Leroy, Brad Moore, Erhard Ploedereder, Jean-Pierre Rosen, Florian Schanda, Ed Schonberg, Tucker Taft, and Tullio Vardanega.

The Convenor of WG 9 is authorized to act for WG 9 between meetings in appointing additional members of the ARG. In doing so, he shall consult with the Rapporteur and the National Body or Liaison Organization nominating the member.

Rapporteurs are permitted to allow other individuals to observe the deliberations of the Rapporteur Group. The admission of observers and the extent of participation permitted to observers are at the discretion of the Rapporteur with the concurrence of the membership of the Rapporteur Group.

This resolution passed unanimously.

Resolution 74-10: ISO/IEC JTC 1/SC 22/W 9 expresses its grateful appreciation to Jeff Cousins for his many years of dedicated service to WG 9.

This resolution passed unanimously.

Resolution 74-11: ISO/IEC JTC 1/SC 22/W 9 expresses its grateful appreciation to Alok Srivastava for acting as secretary for Meeting #74.

This resolution passed unanimously.

Resolution 74-12: ISO/IEC JTC 1/SC 22/W 9 expresses its grateful appreciation to Antonio Casimiro and Luis Miguel Pinho for hosting meeting #74.

This resolution passed unanimously.

Resolution 74-13: ISO/IEC JTC 1/SC 22/W 9 expresses its grateful appreciation to Clyde Roby for maintaining the document list page.

This resolution passed unanimously.

Resolution 74-14: ISO/IEC JTC 1/SC 22/W 9 expresses its grateful appreciation to the Convenor, Pat Rogers.

This resolution passed unanimously.

RECESS

[AGENDA](#)

References

See <http://www.open-std.org/jtc1/sc22/wg9/documents.htm> for the WG 9 Document Log, including the ability to download the documents.