

# ISO/IEC JTC 1/SC 22/WG 9 N0478

24 December 2006

Contribution from SIGAda, Clyde Roby: Notes of Birds-of-a-Feather session on POSIX-Ada Binding, conducted at SIGAda 2006, November 15, 2006, Albuquerque, NM, USA

The notes reference three other documents:

	<b>Document</b>	<b>Availability</b>
<b>1</b>	Initial Work Scope Summary for updating Ada POSIX Bindings IS 14519:2001 to POSIX Draft IS 9945:2008 and Ada 2005	Available on the WG9 web site as document number <a href="#">N0477</a>
<b>2</b>	Ada POSIX Bindings Questionnaire: Input collection for potentially forming a POSIX Rapporteur Group	Appended to this document
<b>3</b>	Slides of presentation by Steve Michell	Appended to this document

Birds-of-a-Feather  
SIGAda 2006  
November 15, 2006  
Albuquerque, NM, USA

Coordinator: Steve Michell (stephen.michell@maurya.on.ca)

Supported by Brad Moore (brad.moore@gdcanada.com)

Third author of handouts (not present): Luke Wong (luke.wong@CMCElectronics.ca)

Steve and Brad distributed two handouts:

1. Initial Work Scope Summary for updating Ada POSIX Bindings IS 14519:2001 to POSIX Draft IS 9945:2008 and Ada 2005
2. Ada POSIX Bindings Questionnaire: Input collection for potentially forming a POSIX Rapporteur Group

Steve then presented his slides (information from selected slides included below):

- State of the binding
  - IS 14519:1999 POSIX Binding to the Ada programming language
  - Based on:
    - IS 9945:1996 POSIX (2 updates old, one major revision) + real-time stuff (5b, 5g)
    - IS 8652:1995 Ada (2 updates old, one major revision)
  - Reconfirmed, but needs update
  - Sep 2006 SC22 gave IS 14519 to WG9 Ada
- POSIX revision: about 1000 functions, 1700 pages in part 2, including complete C library, significant threads and networking. May add “bounded” (aka “safe”) C functions.
- Ada 2005 revision: directories, containers, environment variables, real-time paradigms.
- Canadian Study: Luke Wong, Brad Moore, and Steve Michell performed a 2-pass review of changes, to identify new functions, and to identify changes to existing functions.
- Conclusion: Existing interfaces are stable, some additions of “restrict” qualifications, changes to “errno”s (new exceptions?), some semantic changes – some things have become “thread oriented.”
- Some areas not done in the 1990’s: logging, RT, ... Should we try that now?
- Other areas are now addressed by Ada 2005, so we can remove or obsolesce existing Ada-POSIX bindings. Should we do that? By using Ada 2005 features instead, we get better integration with other Ada features.
- Identified 150 new/uncovered POSIX functions. Probably about 20-50 functions to be created.
- Alternative ways to do an update: reconfirm, new project, corrigendum, amendment, revision.

- “Austin” group will be maintaining the POSIX group, and bring the work to ISO when done. IEEE still holds the original copyright. The Austin group is 3-way combination of IEEE, ISO-SC22, and X/Open.
- Preferred Approach: Canada has made a proposal to create a WG9 Rapporteur Group with Ted Baker (baker@cs.fsu.edu) as the project’s editor (but he is currently not funded). We are looking for members. The final work mode is still undecided.
- Canada proposed Luke Wong as a possible Rapporteur Chair; he is from CMC Electronics, Canada.
- Process? Make it a national body project, an IEEE project, or an Open Group project? Can we “Fast Track” it? It should be made a freely available version – but who owns the copyright?
- Timeline:
  - Ask WG9 to create Rapporteur Group (this week)
  - Start working on the “how to”
  - Parallel work on technical issues
  - Ask IRTAW 2007 (April) to dedicate some time to POSIX
    - To what extent does Ada 2005 supplant POSIX Real-Time functionality (e.g., Sporadic server)
    - Meet 3 or 4 times per year until 2008 (6 to 12 people)
    - In 2008 take draft to WG9 for ISO processing
    - Possibly a completed standard in 2009
- Is there any way to get money to Ted Baker to help pay for travel, etc.? Ted will host a meeting in Tallahassee in February.

After Steve made his presentation (there was some discussion during the presentation of some of his slides), further discussion ensued.

Erhard: [The timeline] sounds too slow for just 20-50 functions.

Steve: We need to go back and look at all existing functions for any changes.

Erhard: Who is conformant to POSIX? Sun, HP; Linux is coming. What about implementation of the binding? Is there a Java binding to POSIX?

Tuck: There are arguments in favor of doing a complete POSIX binding, even if it is redundant.

Erhard: The User wants to be assured that these calls are integrated between different languages.

Ed Schonberg: Just use pragma Import? Isn’t that the zero cost solution? We have gotten rid of variable-argument lists mostly in new POSIX interfaces.

Question: Simplify sockets? Cf. GNAT interface to sockets.

Steve: How long [will the meeting be] in Tallahassee?

Question: What about Windows NT POSIX subsystem?

Steve: I believe it is broken and wasn't ever filled in?

Straw poll (concerning thick or thin binding):

Stick with thick binding? 3

Move to thin binding? 3

No opinion – many.

Tuck: Establish pragma Import usage for thin binding.

Steve: [Should we] withdraw the binding? Why use the binding?

Answers: Try to achieve operating system independence. There is a Windows-based binding. The package POSIX.Calendar already exists and is known to work, it doesn't need debugging, and you don't need to go read the POSIX standard.

To query the community: What *\*parts\** of POSIX are used heavily, e.g., POSIX.Calendar, POSIX.Directories/Files, POSIX.Sockets, POSIX.Processes?

Tuck: Suggestion: Focus on the parts that are used heavily and that are inadequately served by Ada 2005. Obscure pieces can be reached via pragma Import.

Steve: There is a growing importance of multi-core systems and this means that the value of using Ada's tasking is growing, so it is important to have an interface that we know works well with Ada tasking.

**Ada POSIX Bindings  
Questionnaire**

**Input collection  
for potentially forming a  
POSIX Rapporteur Group**

**Prepared by:**

**Luke Wong**                    [luke.wong@CMCElectronics.ca](mailto:luke.wong@CMCElectronics.ca)

**Stephen Mitchell**           [stephen.michell@maurya.ca](mailto:stephen.michell@maurya.ca)

**Brad Moore**                   [brad.moore@gdcanada.com](mailto:brad.moore@gdcanada.com)

**Instructions:**

For the following questions please circle the dot that best represents your position.

If you have any comments on a particular question, please feel free to provide them in the area provided.





		<i>Comments</i>
8.	<p><b><i>How likely are you become involved with a new project using POSIX in the next 10 years?</i></b></p> <p>Least <span style="margin-left: 150px;">Most</span></p>	
9.	<p><b><i>Does your organization/company use POSIX functionality?</i></b></p> <p>No <span style="margin-left: 50px;">Yes</span></p>	
10.	<p><b><i>How familiar are you with Ada?</i></b></p> <p>Least <span style="margin-left: 150px;">Most</span></p>	
11.	<p><b><i>Have you been involved with a project using Ada in the last 10 years? Check all that apply.</i></b></p> <p>No <span style="margin-left: 50px;">Ada 83</span> <span style="margin-left: 50px;">Ada 95</span></p>	If yes, state whether Ada 83, or Ada95
12.	<p><b><i>Have you been involved with a project using Ada in the last 5 years? Check all that apply.</i></b></p> <p>No <span style="margin-left: 50px;">Ada83</span> <span style="margin-left: 50px;">Ada 95</span></p>	
13.	<p><b><i>Are you currently involved with a project using Ada? Check all that apply.</i></b></p> <p>No <span style="margin-left: 50px;">Ada83</span> <span style="margin-left: 50px;">Ada 95</span></p>	
14.	<p><b><i>How likely are you become involved with a new project using Ada 83 in the next 5 years?</i></b></p> <p>Least <span style="margin-left: 150px;">Most</span></p>	







		<i>Comments</i>
36.	<p><i>If you use the real-time paradigm, would you prefer the POSIX real-time, or would you prefer the Ada real-time calls?</i></p> <p>POSIX   Ada</p>	
37.	<p><i>What do you need/use most in POSIX?</i></p> <p><i>File Manipulation (local)?</i></p> <p><i>File Manipulation (network)?</i></p> <p><i>Socket Operations?</i></p> <p><i>POSIX Management operations?</i></p> <p><i>POSIX Real Time?</i></p> <p><i>POSIX Event management?</i></p> <p><i>POSIX Time management?</i></p>	

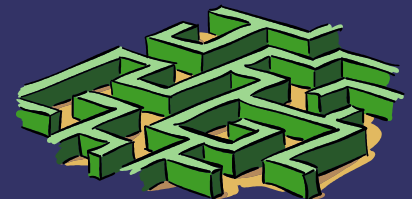
**Thank you for taking the time to complete our survey!**

# *Ada POSIX Binding BOF*

*Nov 15 2006 SIGAda*

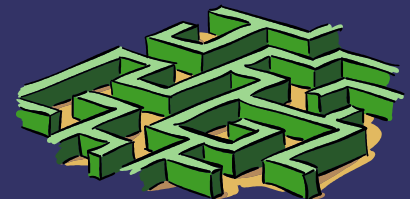
*Albuquerque, NM*

- Stephen Michell  
Maurya Software,  
Ottawa, Canada



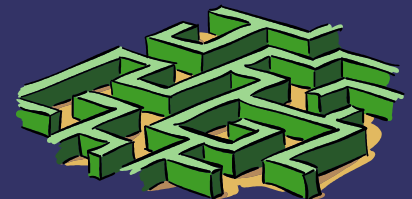
# Meeting Agenda

- Survey
- State of the binding (POSIX, Ada)
- Need for an update
- Canadian Study (summary of our findings)
- Ways to do an update
- Preferred approach?
- Can we speed up process
- Suggested time line
- Other Issues
- Will Volunteer level work?



# *Survey*

➔ Please fill out survey – 5 min





# *State of the binding (POSIX, Ada)*

⇒ IS14519:1999 POSIX Binding to the Ada Programming Language

⇒ Based on

- IS9945:1996 POSIX (2 updates old – one major revision)
- IS 8652:1995 Ada (2 updates old) – major additions
- Editor - Ted Baker, FSU

⇒ Reconfirmed but needs update

⇒ SEP 2006 SC22 gives IS14519 to WG9



# *Need for an update*

## ➔ Major POSIX revision

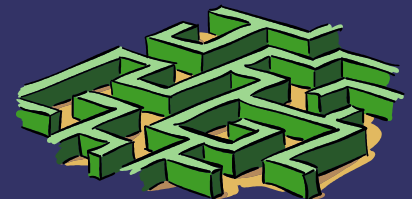
- Combining of all major POSIX specs into 1 document set in 4 parts
- Added complete C libraries
- Significant updates for threads, networking
- About 1000 functions & 1700 pages in Pt 2
- May add Bounded C Functions (supposition)



# *Need for an update (cont)*

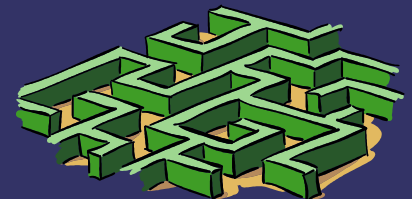
## ➔ Ada 2005 - Addition of

- Directories
- Containers
- Environment Vars
- Real Time Paradigms



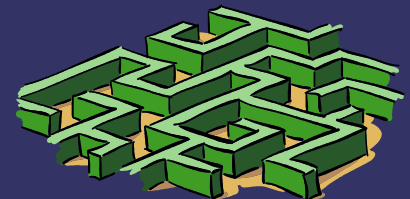
# *Canadian Study*

- ➔ Methodology
- ➔ Findings



# Canadian Study – Methodology

- ⇒ Luke Wong, Brad Moore, Steve Michell
- ⇒ 2 pass
  - Function identification
    - Compare current IS14519:1999 and implemented fn list to Draft IS 9945:2008 POSIX and 9945:1996, and 1003-5b and 1003-5g.????????????
  - Functionality review
    - Reread existing functions
      - Parameter changes
      - Major functionality changes (eg – thread support)



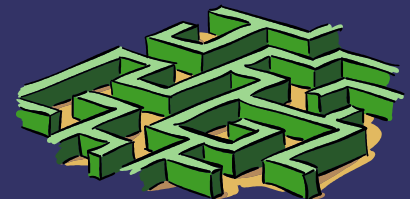
# *Canadian Study – Findings*

- ➔ Existing interface surprisingly stable
  - Most existing functions have little change
    - Addition of \*restrict qualification in parameters
    - Addition of new or changed ERRNO's
    - Semantic Changes (affect interface user, not interface)
- ➔ Areas not done in 1990's still outstanding  
logging, RT, ...



# *Canadian Study – Findings (cont)*

- ➔ Opportunities in Ada2005 to bring more back into Ada
  - Directories
  - Environment Variables
  - Real Time scheduling paradigms
- ➔ Needs careful consideration



# *Canadian Study – Findings (cont)*

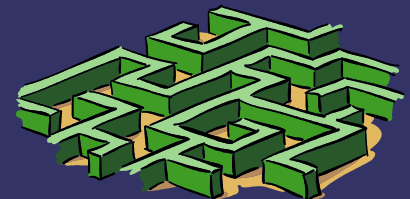
- ➔ Identify about 150 POSIX functions needing consideration
  - Many residual from 1999
- ➔ Decide if functionality covered sufficiently in Ada 2005
- ➔ Decide if needed in an updated binding
- ➔ Estimate – maybe 20-50 new functions





# *Ways to do an update*

- ➔ Reconfirm
- ➔ Start new project
- ➔ Do a Technical Corrigendum (Ada 2001)
- ➔ Do an Amendment (Ada 2005 was an amendment)
- ➔ Do a revision



# *Update Challenges*

- ➔ POSIX started in IEEE 1003 – IEEE holds original copywrite
- ➔ All other POSIX work done by Austin Group as 3-way combination of ISO/SC22, IEEE-SD, Open Group
- ➔ How do we serve 3 masters – can we get buy-in or buy-out?



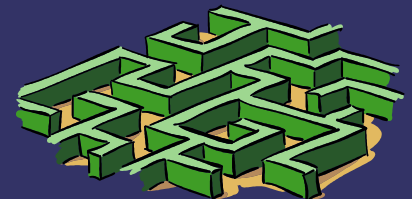
# *Preferred approach*

- ➔ Canada has made a formal report and proposal to WG9
- ➔ Make a WG9 RG
- ➔ Ted Baker still editor – BONUS
- ➔ Looking for members to help
- ➔ Final work mode undecided, but RG will be involved



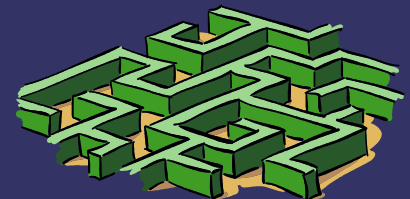
# *Proposed rapporteur*

- ➔ Luke Wong, CMC Electronics, Canada
- ➔ Ted Baker, FSU Editor



# *Can we speed up process*

- ➔ make it
  - National body project,
  - IEEE project,
  - Open Group project
- ➔ Fast Track



# *Suggested Timeline*

- ⇒ Ask WG9 to create RG tomorrow
- ⇒ Start working on the “how to”
- ⇒ Parallel work on technical
- ⇒ Ask IRTAW 2007 (April) to dedicate a day or 2 to POSIX

- Specific question – to what extent can Ada 2005 RT paradigms supplant existing and new POSIX



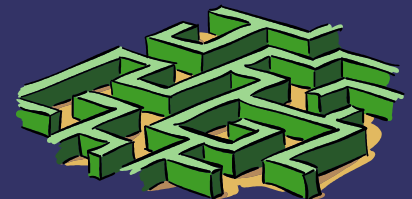
# *Suggested Timeline*

- Meet 3 or 4 times/year until 2008
- 2008 take draft to WG9 for ISO processing
- Completed std 2009



# *Other Issues*

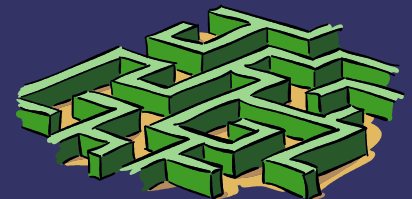
- RT stuff as Ada Annex D
- most file stuff as Ada Directories and Ada.Environment





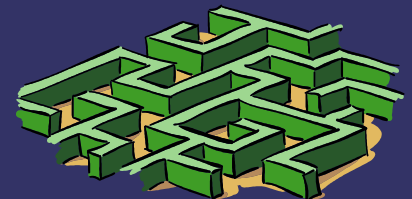
# *Ways to pay for it*

- ➔ (any brilliant ideas???) - probably volunteer  
- which means cheap.



# *Future Revisions made easier*

- ➔ Are there ways to make future revisions easier?



# *Contacts*

Stephen Michell -

[stephen.michell@maurya.on.ca](mailto:stephen.michell@maurya.on.ca)

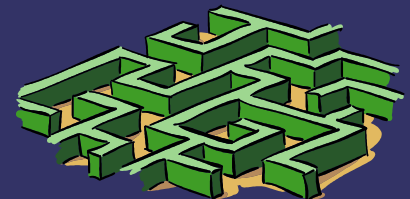
Luke Wong – proposed Rapporteur

[luke.wong@cmcelectronics.com](mailto:luke.wong@cmcelectronics.com)

Editor Ted Baker - [baker@cs.fsu.edu](mailto:baker@cs.fsu.edu)

Canadian HoD – Brad Moore -

[brad.moore@gdcanada.ca](mailto:brad.moore@gdcanada.ca)



# *Discussion*

