Accellera CWG Working Group Meeting
March 29th 2001

Hosted by Mentor Graphics

Attendees:

John Sanguinetti - Forte
Dave Springer - Forte
Brian Bailey – Mentor Graphics
Andrew Guyler - Mentor Graphics
Mark Hartook – C-Level
David Park – C-Level
Kevin Kranen - Synopsys

Apologies received from:
Asa Ben Tzur – Intel
Dan Gajski – UC Irvine

Agenda

The Agenda was presented by Brian and contained the following items:

- Update of the ALC and merger with SLDL
- Discuss any feedback from the open review.
  DATE panel
- Feedback on the Appendix (compressed semantics document)
- A proposal for the donation of CycleC.
- Next steps - Workshop?

There were no changes or additions.

ALC Merger

Given that there were few people in this meeting that were not at the previous ALC meeting, the discussion on this topic was brief and served more as a clarification session on our position within the new organization.

Reformulation of Charter: With the change in organization a number of changes are necessary in the CWG charter. We should remove all references to the ALC. We also had a broader discussion about our long term role. In order to do this , we talked about three different scenarios. This does not mean that we accept any of them as being the eventual outcome and were only used to investigate all possible situations.

SystemC has become the defacto standard for C++ based design.

This leads us to the traditional role of Accellera, which has taken the languages that were entrenched in the industry and acted as a standards body to control the long term development of them. The SystemC steering committee is more interested in the creation of new language features rather than a formalized definition of what they have created so far. This may lead to unexpected changes in the underlying core model. The Accellera CWG may be able to help in the formalization process and ensuring a proper path for backwards compatibility.

The initial goal of the CWG was to define appropriate places for information interchange between tools. Whatever language is used, this function will still be necessary. Clearly, the entire SystemC language

is not going to be synthesizable by a single tool and as the language grows, subsetting will be an absolute necessity. What is needed is a set of definitions for exchange at different levels of abstraction. What we have developed so far are the RTL exchange semantics and thus we are already heading in the right direction.

The eventual leader has not yet emerged.

The CWG has performed a very useful function in acting as a melting pot for ideas in this area. It is acknowledged that a considerable number of features have already migrated between the various competing systems and has helped to bring them together. Eventually it should lead to the best ideas being adopted by all of the languages such that for all intents and purposes a defacto standard does emerge. We must continue to provide an environment for this exchange of ideas to continue.

If a single language does not emerge, then we must continue to ensure compatibility between them by ensuring a base set of semantics are defined for interchange. While this may limit the usefulness or expressiveness of some of the languages it will ensure that customers are able to make a determination based on the quality of tools rather than of the language.

We may all be heading in the wrong direction.

We should start to look at existing languages and how they map into the semantics that we have, or intend to define in the future. When we find areas were we do not have a match we should learn why these syntaxes existed and use this to define the directions that we should be going in. Since our work is syntax independent, the semantics that we define should not be overly tied to C/C++ such that can be used for any language that emerges in the future.

Open Review Period

Brian reported that 23 people had signed up as new active participants in the working group since the announcement of the open review period. All attendees of this meeting were a little disappointed that none of them were present at this meeting and we discussed ways to get them more involved. This will be covered later in the Workshop section.

There was only a single written response that had been received so far. A copy of this was distributed and is attached at the end of these minutes. Most of the points made in this response were generally in line with the thinking of the group and the desire to have the compressed semantics document be the main document and the current description an appendix was in line with what Dan has been pushing for. Since there was no strong reasons for not doing this, then this will be adopted.

Compressed Semantics

We performed a review of the compressed semantics document. The following changes were made along with a number of pen issues that need to be resolved:

- Since this document is now intended to be the main document, it probably needs to be preceded with a set of definition for the terms that we are using. For example: wire, register, ports etc.
- 3.3.1 This was modified to read: Data type can be any supported data type so long as it is statically defined.
  It is expected that eventually we will reference a standard set of datatypes here such as the VSIA datatypes standard when it is issued.
- 5.4.4 There was some confusion on this item. Does constants in this regard mean a statically evaluated expression?
- 5.4.6 This item needs some work as its meaning is not clear.
- 6.4 For the whole section of data conversions, we are perhaps being a little too restrictive. In this section we are talking about the conversions from and to integers and bit-vectors. However, any data conversion can be supported by a FSMD. What we are attempting to define here are some implicit conversions that we believe that we can embed. Is this a good direction to go in?

- 6.5.2 We start the paragraph with a very strong statement – “the data exchange must be synchronized” and we end it weak “Any other version of handshake protocol may be used”. This is an area in which we have not quite decided on our stance and we need to tie this down.
- 7 Rename section Functional Hiererachy of FSMDs. There was a lot of confusion between structural hierarchy and functional hierarchy.
- 7.2 It should be necessary for a child to have a done signal if the parent does not receive any data back.
- 7.4.1 We currently assume internal fanout of the start signal. Some members think we may need external fanout as well. A reason for this needs to be determined.
- 9.7.1 Additional item. If an asynchronous reset does not propagate to all registers then the results at these registers without a reset is indeterminate.

Cycle C Donation

David Park from C-Level gave a brief presentation, which outlined the proposed donation. This presentation is available on the web site on the presentation page. The main area of discussion was to ensure that the intention of its usage and the direction of the group were aligned. We talked through some worst case scenarios to find out if any of them would be detrimental to either party.

C-Level expressed a desire to keep the material in a fairly close environment until we were ready for a release that contained the donated information.

All reference to C-Level will be removed from all materials donated and will be replaced by an Accellera designation. At the time of release a reference will be made indicating that the work is based on a donation from C-Level.

It was generally agreed that this would provide a benefit for people looking at using the semantics document as it would show them how the semantics can be expressed in a standard language such as C . The resulting material would be presented in an Appendix as an example of how the manual could be put to practical usage.

No guarantees can be made about the amount of the donation that would appear in any derivative document.

It was unanimously agreed that the donation should be accepted

One side issue that emerged from this discussion was one of conformance. It is our strong desire not be to engaged in conformance testing, nor are we interested in acting as an accreditation body for implementations. While we may want to do work on showing how languages may or may not conform, it would be the industry that must police the vendors who claim compliance.

Workshop

As we get to the tail end of our work on the RTL level, we need to start looking at the stage for the work. At the original formation of this group, we had a successful workshop format were we allowed all interested parties to express their views on the direction that we should go in. We plan to do the same this time around. With that in mind Dan Gajski has proposed and offered facilities for such a workshop on

May 8th in Irvine, California

Since this is not far off, we need to find out who would be interested in attending and who would like to make a presentation. All members are charged with soliciting presentations.

Action Items

** All. Decide on our position for the synchronization of FSMDs with multiple clocks.
** Dave – Justification for external start signal fanout.
** Brian – to craft a new charter statement for email distribution to group
** Brian – Craft the letter of donation between Accellera and C-Level
**All – Line up a list of presenters for the workshop.