

Date – 20-Jan-2012

Minutes of the IEEE-1149.1 Working Group Friday meeting

Attendees:

Adam Ley
Bill Eklow
Brian Turmelle
Carl Barnhart
Carol Pyron
CJ Clark
Craig Stephan
Dave Dubberke
Dharma Konda
Francisco Russi
Heiko Ehrenberg
Hugh Wallace
Jeff Halnon
John Braden
Josh Ferry
Ken Parker
Peter Elias
Rich Cornejo
Ted Eaton

Excused:

Adam Cron

Meeting called to order at 11:32am ET

Current Draft: See private area for latest draft

Meeting

Carol suggested to Carl to begin the meeting with a discussion of the requirements list.

Carl stated that he was disappointed with the limited responses to the requirements document he posted on the reflector. He stated his concern that discussion should be on the reflector, but only 2 related responses were posted on the reflector. He stated that he thinks that nobody cares about the motion. No progress can be made without discussion on reflector. We need to move on.

Ted said that adopting PDL without further discussion is not procedurally correct. Wants more discussion. Ted says that he does not want to create trouble.

Carl said that Ted should discuss things on reflector.

Ted agreed that this would be okay.

Carl suggested that we discuss changes to annex C. Annex C has been in draft for 6 months. Group should discuss changes from 6 months ago. Each working group member likely has requirements in mind already.

Ted stated his opinion that members can request a feature that they see a need for and the standard will adopt too many commands.

Carol says that we have talked about new features for a while. Wants to reach a PDL that is useful and consider each one. Do not need anything complex

Carl suggested that people can have an idea and should sell their idea to the WG.

Carol mentioned that we have wanted to have a side file for years.

Ken stated that he saw many emails on reflector responding to Wim's email.

Carl did not see these emails as related to the discussion of the requirements.

Ken stated that the side file has evolved from simple to more complex. How complex are we going to support in the side file? Can hide complexity in hardware and make PDL simpler or vice versa. Where do we draw the line?

CJ sees the need to anticipate challenges of IC designers. Single data scan will not solve init setup problem. ICs are now more complex. The requirements are anything within scope of the 1149.1 standard. People should re-read scope to get requirements.

CJ suggested that we discuss the issue about the "All IR" email. Carl modified text from "all IRs" to "the IR". Ken was satisfied with the modification.

Carl talked about the hardware/software tradeoff. Chip architecture includes tradeoffs. If we have external PDL to make the hardware more generic, this reduces the risk of faulty hardware causing the test to not work. External SW routine can more easily be changed. PDL-0 include commands that can't be easily translated/interpreted/compiled to prod tester. iMatch should be ok. Asked KP for feedback on commands/ error checking of PDL for prod tester.

Ken spoke about test routines in hardware.

Carl notes that tradeoffs are made for putting test features in hardware versus software.

CJ and Carol asked Ken to clarify his point.

Ken said that an internal processor/state machine could run code to run test routines.

Carol said that a processor-based solution is expensive to implement and not often used.

CJ stated that an internal processor would likely need a clock other than TCK. Init_Data may be implemented as a pull architecture where the hardware takes data from init_data register upon a trigger event. CJ advocated a push architecture where he can control the IP block directly.

Carol stated that the trigger can be init_run or extest.

Ted said that the trigger can be update-DR.

Peter Elias stated that the PDL is getting too complex for board-test people. Wants clarification/division between PDL-0 and PDL-1 commands. Sequences and handling of power domain is a concern. Suggested simple section of PDL-0. Annex for more complex PDL-1 commands. Wants explicit explanations.

CJ stated that there is operational difference between PDL-0 and PDL-1. There's a different use model. PDL-0 is targeted for memory-behind-pin. PDL-1 is more interactive. Tests like PRBS testing are better set for PDL-1. There is a bit of overlap between 2 standards.

Verification suite could include IC Reset. PDL-1 commands could be included or informative. You don't have to use all PDL commands. Wants flow from IP supplier to IC vendor to board vendor.

Peter stated that the 2 levels of use are not separated enough. Division unclear. Pre-condition and post-condition do not require a scan from the hardware.

CJ stated that the group has some misunderstanding. iGet does not require a scan also.

Peter has no objection to PDL as a language. Wants differentiation between PDL-0 and PDL-

Ted commented on text "executed/compiled/interpreted" in requirement document all being necessary to support PDL-0.

Carl replied with "whatever the tester needs." Test software can absorb PDL-0 and run the vectors on the tester.

CJ suggested "Load and go tester" as a term for PDL-0 support. PDL-0 can be processed to create a binary to load and execute on the tester.

Ken stated his concern of how to compose activities on multiple devices on a chain.

CJ stated that Annex C lists command limitations. Commands can't be used everywhere. Many commands can't be used in init-setup. No requirement to load all device's init-setup register at same time.

Ken stated that he can init devices one at a time in chain, but some chips/chains could require writes at same time.

CJ disagreed and stated that no simultaneous init-setup is required. That's what init-run is for. Carol concurred.

Ken said ok.

Carol stated that Init Run is a single register

Ken wants to understand the polling required for tests. Polling can be complicated. Multiple bits with looping.

CJ did not have this complicated polling in mind. Polling can be for single value.

Carl stated the need to revisit init setup and init run since adding power domain and other changes. Need to specify what's allowable.

CJ stated the need to specify pre-defined procedures. Carl concurs. Carol would be interested to help with procedures.

Carol suggested that the meeting continue with a look at Annex C.

Ted stated that he did not realize that we're supposed to debate the requirements on the reflector.

Carol answered that the request for feedback to the reflector was included in the email from last week.

Ted had issue with transitioning the TAP state machine to Pause-DR.

CJ stated that this function was added to support read-modify-write operations.

Heiko stated that he would want flexibility to transition the TASP state machine from Update-DR to Select-DR and bypass Run-Test-Idle.

Ted stated his opinion that the working group should have voted on all decisions along the way.

Dharma talked about the balance between software and hardware. He talked about using an internal CPU to drive the test test pins. Do we need the language in this case?

CJ stated yes. We need to supply informaton from supplier to integrator. Need formal language to tell how to use the IP.

Dharma suggested that if the CPU understands the PDL, then an internal processor core can apply the vectors also.

CJ said that this is very advanced and beyond this standard.

Josh likes the idea of a list of requirements to better focus the working group. Likes effort that Carl has put forth. Good exercise to finalize the requirements document.

Carl requested feedback on reflector, even if in agreement.

Josh re-affirms his support for PDL-1.

Carl will put the updated requirements on reflector after the meeting.

CJ stated that Bill Eklow's input is valuable because Cisco has a number of SERDES links.

Bill stated that software solutions are better than hardware. He does not see a problem with PDL, except logistical issues between 1149.1 and P1687. Expressed concerns where each standard uses the same PDL constructs but one wants to make changes and the syntax diverges. Bill stated his desire to keep the commands as similar as possible.

CJ stated that there will be command differences to deal with problems like those that Wim proposed.

Bill is okay with some differences.

CJ stated that he suggested to P1687 to change iProcTargetModule to iPRocTarget, but the request was denied.

Ted suggested that 1149.1 should create its own language instead of PDL.

Hugh sees what CJ is doing with PDL. Would be a disaster for syntax that is almost similar, but not identical.

Carl would be happy to work with Hugh one-on-one to normalize command set.

Ted stated that P1687 is not accepting any new proposals and that P1687 would not be open to change. They may not want to add init-run and init-setup.

Hugh suggested listing reserved procedures in p1687 that may be used in 1149.1

Ted suggested that there is no place in P1687 for this reserved procedure list.

CJ stated that 1149.1 can't do everything the same as P1687. He provided an example where P1687 uses more of a verilog syntax for numbers, and 1149.1 uses more of a VHDL style.

Hugh stated that he's not at the meetings to homogenize the languages.

Carl has regrouped commands in latest draft.

Meeting adjourned 12:58pm.

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Action Items:

- Continue PDL discussions over the reflector this week.

Next Friday Meeting:

- Next Friday meeting is on 27-Jan-12