IEEE 1149.10 High Speed JTAG Working Group Minutes

Date – 11/04/2013
Attendees: CJ Clark, Adam Ley, Bill Tuthill, Brian Turmelle, Bob Gottlieb, Craig Stephan, Dave Armstrong, Dharma Konda, Dwayne Burek, Frans de Jong, Gobinathan Athimolom, , Kevin Gorman, John Colburn, Ismed Hartanto, Marc Hutner, Mike Ricchetti, Philippe Lebourg, Steve Sunter, Zahi Abuhanmdeh

Absent with Excuse: Teresa McLaurin,

Missing: Kent Ng, Tom Waayers, Bill Huott, Tapan J Chakraborty, Saman Adham, Gurgen Harutyunyan, Josh Ferry,

Agenda:

1. Patent Slides
2. Revise WG P&P to include limits on voting by members with the same affiliation?
3. (Input from Mike R.) Suggested fix for 4.1.1?
   a. <mark>No more than two members with the same affiliation may vote on any motion .</mark>
4. (Two places I changed are marked with a comment from me to make finding it easier. One was grammar.   Adam Ley had some grammar input but I have not received specifically those changes.)
5. Brief introduction of 8b/10b encoding and Start of Frame.
6. Continued discussion on distribution matrix and packet format.
7. New Business

Meeting Called to order at 11:07 am EST

Minutes:
Review Patent Slide – Slide Presented to the Group.
    Solicited input from anybody who is aware of patents that might read on our
    standard.
No Response

Suggested updates to P&P (Mike R's input)
Adam Ley also has a few suggested updates and will send CJ email

Mike wasn't able to attend last meeting where P&P was voted on.
 Section 4.1.1 change to "No more than two members with the same affiliation may vote on any motion"

Ismed asked for a clearer definition of "Affiliation".
CJ pointed to the IEEE definition and CJ will send out the link on the reflector
CJ will make edits to P&P and group will vote on the updated document next week.
Mike agrees his comment was captured.

The working group members will announce their affiliations next week and will be recorded in the attendance spreadsheet. Any changes of a member's affiliation will be sent to the secretary to be updated on the spreadsheet.

8b/10b encoding review
8b/10b encoding done to minimize the run of 1's or 0's to allow the clock to sync on the data.
8b/10B also gives us Control Characters. An important control character is K28.5. This is an idle character. This character would be transmitted on a line while data isn't being sent.
These characters are ignored by the receiver's decoder
Running disparity – the count of extra 1's or extra 0's.
    State machine has a power up state – K Character will be negative running disparity (RD-)
    As soon as it is sent you would need to send the RD+

Dave – Concern that the startup sequence associated with any SERDES link may not be functioning correctly. This is worrisome. If the part or tester is in the wrong disparity, everything goes wrong quick. If we are relying on the interface as the test interface, we need to keep an eye on this aspect as it could be trouble.
CJ – Doesn't see how it could be trouble?
Dave –What do we do if the disparity isn't working on the p1149.10 interface? We have to use the JTAG to setup some test of the PHY for the test and make sure we have a robust test for that first before we pump scan data through it.
CJ – different people will come in with different approaches. Probably won't mandate how you should be doing the test. Some tests done through 1149.1 TAP interface to verify that circuitry. Some tests will be done though the p1149.10 interface.
CJ – were you driving your PCIe from memory behind pins?
Dave – Doing this the right way requires a correct working protocol on the tester which is expensive. The tester would need to be protocol aware
CJ – 8b/10b encoding and comma detect is done by a hardware front end. Not through test vectors. Would need 8b/10b encoder for transmit side.
Dave – has been working with SERDES for a while. Has been working with real device challenges. Question is do we need both 1149.1 and p1149.10 on the device. In my opinion you need both to have the 1149.1 interface to setup the PHY and test PHY.
Steve – agrees with Dave's concerns. Key difference between TAP and SERDES interface is that SERDES is non-deterministic interface. Need to make provision to check that interface.
CJ – it is different but not unique to 1149 standards. Paradigm of the tester changes a little due to the protocol interface.
Philippe- feels this is a personal opinion and doubts that every chip maker is in agreement.
Steve – going through a SERDES interface and just check that the ECID comes back isn't very thorough.
    Checking a few bits come back correctly is meaningless.
    Feels that SERDES is unique to an 1149 interface by being non-deterministic.

Philippe – could you state what you mean by non-deterministic?
Steve – with a SERDES interface you cannot determine the data at a specific time slot
  The 8b/10b encoding is for line balancing voltage.
Marc – Feels that a CRC that says that the correct data has come to the device is needed.
CJ – 8b/10b encoding gives idle character. Also gives us the ability to add commands and rather just data.
  Gives a deterministic pattern after you remove the 8b/10b encoding.
Dave – challenge is that there is a lot of testing of the SERDES before the SERDES turns on. Want to make sure we have the access mechanism to verify the SERDES.
CJ – our mission isn't to define that. Don't want to specify how to test the SERDES.
  Not up to us to dictate how someone will test their SERDES interface. Should let the IC vendor test the SERDES.
Steve – assume that testers have a SERDES in them and that is how they will communicate with the device?
CJ – things that is a reasonable architecture.
Steve – a lot of testers don't have SERDES in them
Philippe – seems disconnected from the real life day to day of the chip makers.
Dave – need some level of checkout or loopback to make sure the SERDES works. Can't just jump into test and think it is all working.
CJ – has shown a slide with loopback on it. Want to be able to test at some level the infrastructure.
Bob- need to make sure that we believe we have a solution to test the interface.
CJ – once you remove the 8b/10b encoding the data is deterministic. And we are CRCing (32 bit) on every packet. On the tester side it is deterministic. Each bit is checked and we know the packet format. In the tester you will have a payload that is deterministic.
Bob- that is assuming that tester is doing the alignment. Or it won't be deterministic.
CJ – if you don't have a SERDES receiver doing the alignment for you than you are probably chasing something that is not real.
Dwayne – always assuming that 1149.10 is protocol aware. Not memory behind pins.

Dave – Teradyne and Avantest have protocol awareness today and can do it. Question is do we want to do it.
  ATE vendor perspective prefer the protocol awareness. Not sure industry wants it.
CJ – do we move forward with the technical challenges or focus on the worries.
Philippe –was first interested in concept. The problem is can't see today it making financial sense to be translated to real hardware today
Bob – need extra bandwidth and it makes sense to do. Doesn't think that the discussion on making sure that the interface works isn't shooting down the standard, but a worth wild part of the discussion.
CJ – we are beyond memory behind pins. Need some sort of bit aligner
Dwayne- always assumed it is driven by a protocol aware ATE. Would like update from tester vendors.
CJ – if we don't have this, what do we end up with?
Bob – right direction but making sure the testers keep up with it.
CJ – that is why they(makers of test equipment) are joining the meeting.

Philippe – in order to go ahead, we all need to agree on what it is we are doing. Not sure we have got there.

Frans – high speed for testing is important.

Separate the two halves of the diagram and have separate discussions of your left hand and right hand sides of your diagram.

CJ – there are a lot of pieces that haven't come together for some. That is why we should be leaning towards letting the pieces gel.

Should focus more on the CanDos. There are challenges everywhere.

Dwayne – if there is an alternate proposal that satisfies the bandwidth requirement maybe that can be proposed. If someone has a better idea than SERDES they should make a proposal.

CJ – true if you have a proposal please post to the reflector.

Bob- binning this discussion and moving back to the right side of the diagram is ok.

CJ – would like to get some of the objections on the reflector. Then we could use the meeting time more productively.

CJ – would like to move forward. Knowing that these things don't exist now shouldn't stop us from moving forward.

Would like to focus on getting to the technical details

Dwayne – motion to adjourn

Frans – seconds.

Meeting adjourned: 12:15 EST

Motion Summary
        No motions made

Action Items
~~Bill Tuthill – 10-21-2013 -Add minutes and Attendance spreadsheet to the website.~~

Next Meeting:
November 11th, 2013 11:00am

NOTES:

1149.10 working group website - http://grouper.ieee.org/groups/1149/10/

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