

**Date – 1/26/2015**

**Attendees:** CJ Clark, Bill Tuthill, Brian Turmelle, Craig Stephan, Dharma Konda, Dwayne Burek, Frans de Jong, Gobinathan Athimolom, Gurgen Harutyunyan, Jon Colburn, Josh Ferry, Marc Hutner, Steve Sunter, Tapan J Chakraborty, Kathryn Bennett,

**Absent with Excuse:** Adam Ley, Bob Gottlieb,

**Not present for  $\frac{3}{4}$  of meeting:**

**Missing:** Bill Huott, Carol Pyron, Jim Wilson, Kent Ng, Kevin Gorman, Tom Wayers, Heiko Ehrenburg, Dave Armstrong, Roger Sowada, Zahi Abuhanmdeh, Mike Ricchetti, Saman Adham, Teresa McLaurin, Philippe Lebourg, Ismed Hartanto,

**Agenda:**

- 1) Patent Slide
- 2) Comments on Draft 51 from last week
- 3) Review of Draft 52 (new).
- 4) New business
- 5) Adjourn

**Meeting Called to order at 11:06 am EST**

**Minutes:**

Review Patent Slide – Slides Presented to the Group.

Solicited input from anybody who is aware of patents that might read on our standard.

No other responses noted.

Comments of Draft 51

No new comments on Draft 51

Review of Draft 52

Steve – 6.1.2 f) control character is only for last chip? Or would it clear whole chain?

CJ – as it is currently written it you clear chip by chip. Was proposing a clear that would clear all chips.

Steve – Reset vs Clear. What is the appropriate time to use each of those?

Would like to get clarification on that.

CJ – clear would only go to targeted ID. And not to the rest. If it doesn't match than a chip in the chain would forward the control character.

Issue the clear when you are in an unstable state to flush everyone in the chain because of a partial packet. If you clear just one you are forced to send out target ID's to each chip and try to clear each chip. But may have difficulty sending clears.

Part of the Proposal (not in v51) for 52, would be if you received clear you would forward the clear on the transmitter so it would be received by other HSTAP and PEDDA so everything on the daisy chain would be cleared.

RESET packet is solely for issuing Test Logic Reset on scan channels. That is why CLEAR exists. Reset is full packet, and assumes channel works. Only dedicated for

issuing TLR and resets TARGET ID. Doesn't affect data buffers and channels that are receiving data. That is what is supposed to be with the Clear.

Steve – Target ID would remain untouched or would it be cleared as well?

CJ – No it doesn't clear the TARGET ID.

Steve – CLEAR has the highest priority? Starting from a known state?

CJ – all of the control characters have the highest priority.

That is where it is heading. Updating f) and make set of rules around CLEAR

CJ – XOFF/XON is similar. And would forward the message through the daisy chain

### Call for New Business

Steve – thinking about how you would do design if you have SERDES with a 4 byte wide parallel port and is 8b/10b and you are able to intersperse IDLEs anywhere in that. It makes the interpretation of those words messy. If the data has not been formatted for that word width. The packets oriented around byte boundaries and not word boundaries. Has anyone explored multi-byte wide on a receiver with the current packet format as shown in the draft?

Conclusions: Need to know the parallel port width.

When you send IDLEs or any control characters you need to anticipate the parallel port width and send the number of control characters.

Would want to have a form of these commands and make sure the boundaries always happen on the word boundaries. Payload should be formatted to make word boundaries

Marc – EDA tool making patterns would need to do that.

Marc – This might be divorced from the standard. More the mix and hardware you are targeting and what you want to test.

Steve – tried to think of how you would divorce but can't think of how to do it.

Coming up with the standard you should show one practical implementation of how to do it.

Marc – Compiler needs all the information to create packet.

CJ – DATA SIZE is what is described for the formatter to format the data correctly.

8b/10b the interface is either going to be 10b wide or multiple of 10b. or if it is in 32bits there is an indicator that it has received a control character. So that tells interface that there is a control character.

IDLE character is stripped before reaching the PEDDA. PEDDA never sees IDLE.

Steve- how does PEDDA see CLEAR character? That is a control character. Can't ignore control characters.

CJ – normal SERDES communication the IDLE character isn't delivered beyond the phy?

Craig – data is still moving.

Steve – either all control characters go through or all control characters are dropped.

CJ – not sure on that.

## IEEE 1149.10 High Speed JTAG Working Group Minutes

Steve – becomes necessary to see where we are drawing the line where there is mission circuitry to what is handed over to the test circuitry.

CJ – next week we can walk through the something like the Xilinx Aura Protocol to see what the control characters do.

Steve – not concerned about scan data, but want to understand the packet coming in.

Need to recognize different pieces of packets and setup circuitry to pick these pieces out of the 4 bytes of the packet. And then start rotating through bytes in sequence.

Dwayne – need some barrel shifter to align the bytes?

CJ – if you think in terms of a parallel phy driving the scan chains it gets complicated. If you think of data coming off of the phy and going into a fifo and driving the chain it is easier.

Steve- the FIFO is part of the HSTAP. But after the fifo that is where you take those bytes and format a 32bit word. So you need the barrel shifter to start the interpreter where the first SOP comes up.

CJ – we could simplify it so that your SOP is in the right position. But think you could control everything from the size of the data size

If we create a rule based on the size of the phy there is no way to validate the size of the phy.

Steve – we should have an example block diagram of a multiple byte parallel port more than 8 bits.

Dwayne – there must be some control character on a side channel.

CJ – the phy can't be 8 bits wide without there being a signal to indicate that a control character is present.

Send any New Business requests to the reflector

Please use reflector to review what is in the latest version of the draft. Please send any comments on the new material to the reflector. This will let us get a start on the material before the meeting. Please include anything that needs to be updated or anything you would like discussed

**Motion to Adjourn: Steve**

**Seconded: Dwayne**

**Meeting adjourned: 12:05pm EST**

**Next Meeting:**

Feb 2<sup>nd</sup>, 2015 11:00am

***Motion Summary***

***0 motions made***

***Action Items***

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

IEEE 1149.10 High Speed JTAG Working Group Minutes

~~CJ ————— 11-11-2013 ———— Reach out to ATE industry and Probe Industry to get update on future of ATE equipment to see which data speeds and protocols they are heading towards.~~

~~Philippe – Look into alternative method to create control information (pause, start, terminate, etc.) rather than using K characters in packet.~~

~~Bob – create a case study to show use of Attributes~~

~~Frans – will start some block diagrams of a simple use case to help illustrate the current architecture~~

~~Dwayne – present to the group his ideas for a simplified scheme – Direct Interface.~~

~~Adam – invite someone from IEEE to speak on IEEE benefits of standardization at WG meeting~~

Call for Essential Patent notes

Adam Ley 12/1/2014

PN, TTL, AN

7348796, METHOD AND SYSTEM FOR NETWORK-ON-CHIP AND OTHER INTEGRATED CIRCUIT ARCHITECTURES, DAFCA INC.

Steve Sunter 11/17/2014

1. US 7610532 "Serializer/de-serializer bus controller interface" Avago, granted 2009
2. US 7739567 "Utilizing serializer-deserializer transmit and receive pads for parallel scan test data" Avago, granted 2010
3. US 8543876 "Method and apparatus for serial scan test data delivery" Altera, granted 2014

NOTES:

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

Here is the WebEx conference link.

<https://meetings.webex.com/collabs/meetings/join?uuid=MAG12PB7HN5W24AM2EOKIOM9KS-KERT>

You can use VOIP on your computer or dial-in using the phone number below.

Audio Connection

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