Date – 21/Oct/2011

Minutes of the IEEE-1149.1 Working Group Friday meeting

Attendees:
Adan Cron
Bill Bruce
Brian Turmelle
Carl Barnhart
Carol Pyron
CJ Clark
Dave Dubberke
Jeff Halnon
John Braden
John Seibold
Josh Ferry
Ken Parker
Peter Elias
Roland Latvala
Roger Sowada

Excused
Sankaran Menon

Meeting called to order at 8:30 am MST (AZ)

Current Draft: P1149 1 Draft 20111001.pdf

Agenda/Overview:

- Discussion of resetting the pulse mon cell
- Discussion on non-selected register segments

Minutes:

Pulse Mon cell:

John had idea to reset the monitoring flop right after capture.

Carl – Do we want to add this?

CJ – I think it's a simple change.

Carl Discussed figure 9-11 and 9-12

CJ – Using a 1 value as a pulse. Pulse1 or Pulse0, using PO or PO*

Carol – So pulse0 means someone connected PO* to downstream logic.

CJ – Yes

Carol – Why do we care?

CJ – You do care about this edge. It produces a trailing rising edge after update.

Carl – Synthesis will change this anyway. All sorts of changes.

CJ – People will start looking at these more closely.

Carol – In manufacturing scan we will make all these flops scannable.

CJ – I wouldn't advise it.

Carl – Today microprocessors scan all this digital logic.

CJ – You really want to access these flops without muxing system clocks for scan.

Carol – Scan doesn't interfere with any functional logic.

Ken – One more question on fig 9-11.
Monitor flop is rising edge.
Mux is also on rising edge.
Is this a race?

Carl – No there is enough skew to avoid the race. Someone should confirm this.

Register Segments:

CJ – Let's move on to the segments and what happens when a segment is not selected. The signals are globally distributed to the tdrs.

Carol – Is this a rule?

Carl – I'm not sure it is even a recommendation.

CJ – There were some flaws in the early Std. We might need to tighten this up a little bit. We don't really want that problem to exist.

Carl – 9.3.1.j recommends tdr's should maintain their states when not selected.

CJ – In segments which are off we need the same thing. We don't want any activity on the segments which are off.

Carl – For the boundary segments?

CJ – For user defined tdr's too. Can you go to the figure of the control cells? Can you go to figure 9-14? The capture-tdr, shift-tdr, update-tdr should also go into this segment to avoid accidently turning something on with TDI data is going into this segment. This could activate functions in the non-selected segments and this could be a problem.

Carol – Two cases:
1. We could pump zeros down a segment using another mux to disable cells.
2.

CJ – If you get it right great, but this could be just another way to solve the issue.

Carl – What was the second scenario?

Carol – The 2nd was:
2. A long chain going through multiple bists, and we want to shorten the scan and drive them in parallel with common data to speed up the shifting of the test.

Carl – That sounds like a private tdr.

Carol – We could choose to make this public and tell user to program one bist eng, and they get them all in parallel.

CJ – This is a reuse to use segments as 'broadcasting'

CJ – I see this in P1687. Here we want to get it right, for the less skilled, and not shift garbage data into the non-selected segments

Adam – This particular excluded segment is not part of the boundary correct?

CJ – Yes. BSR has other issues.

Adam – This non-selected segment could be doing its functional purpose.

Carl – This segment should obey the rules for tdr's that are not selected for scanning.

CJ – What I'm saying is we are not allowing SO data to be loaded into these segments when not selected.

Adam – It won't capture or update but it will change. Is that ok?

CJ – Yes.

Adam – I'm still confused. You are saying it can change by any signal except for these 3 signals.

CJ – If we are saying it is excluded, you shouldn't be driving it. The segment we are excluding shouldn't be modified by the segment we are excluding.

Adam – If you don't expect it to be the same, why do you care how it was changed?

CJ – I'm thinking of the simple things. Go bits, and so on. All bets are off if they mess it up.

Carl – We already have recommendations for this. In any case we can strengthen the rules to say any segment not selected should behave as a tdr that is not selected for shifting between tdi and tdo.

Carol – I think you are being overly cautious.

Carl – What is the problem for the non-selected segment to follow the rules of a non-selected tdr?

Carol – Ok, but let's not tighten the rules of a non-selected tdr.

CJ – You can do your own thing, but it would be better to have the rule in place for 99% of the other folks.

Carol – How do we verify this.

CJ – Long ago we had discussion about update registers. Lots of discussion on this. The Std took a different view and we put protections in place for people to be successful who are not on the cutting edge.

Carol – I understand for EXTEST. For internal tdr's I do not think this is a good rule.

Adam – Sec 9.3.1.g/h defines the rules of the behavior for non-selected tdr's.

Carl – Discussed 9.3.1.g,h,i,j

Carol – I think this is ok with me. How many problems do the current rules/recommendations affect users in practice? Adam is this ok?

Adam – Yes.

Carol – CJ you want to make j.) a rule?

CJ – You are referring to j.) for a tdr. I'm discussing non-selected segments.

Ken – Figure 9.14

CJ – The test data interface for non-selected tdr's. Figure 9-4 (test data register control gating). We need people to follow this recommendation strongly even if not a rule.

CJ – The switch-mux is performing the same thing as the instruction decode. (shift, capture, update tdr).

Carol – I see, I thought it needed to be broadcast from the TAP, but it can be local.

Adam – Is this P1687 gating control.

CJ – We should at minimum gate the update, assuming update cells are used, to avoid ripple.

Carl – If there are update flops, the update would have to be gated.

CJ – I'm concerned for the general community to get it right.

Carol – I don't know if that is reasonable protection. Assuming designers don't get it correct.

CJ – Designers have other concerns beside JTAG. We want them to get it right.

Carol – I dislike rules that limit design flexibility for efficiency.

Carl – Those can be private.

CJ – These rules won't prevent that. We don't want 20 ways to talk to tdr's. It should be on a plane playing field so people do it the same.

Carol – Why can't that be a recommendation, not a rule?

Ken – I'd like to add something.

CJ – Wait Ken, let others comment on this before we move on.

John S. – I'm leaning for it to be a rule.

Carl – John is a rule on update-dr sufficient?

John S. – I'd like to think on that.

Adam - What happens in RTI for the shift flip flops?

Roland – I'd lean towards just gating the update-dr assuming the update stage is in place.

Ken – I'd like to go back to figure 9-14. I don't think it is detailed enough. There are up to 3 signals going into this box. The PO should be gated by at least the update. The shift, capture, and update should be added. The shift and capture are recommendations, and the update should be a rule.

CJ /Carl– Yes.

CJ – This is not the boundary register, just for other tdr's.

Ken – The boundary register is also a tdr.

CJ – For the boundary register the mode should be gated.

Carl – The boundary register has additional rules for when it is not selected. It's not clear to me still.

CJ – I think we need figure 9-15 for the boundary register too. That would clear it up for everyone. The public doesn't have time to study the Std. They want it right automatically. We should show the signal that comes into the mux of the boundary register should be gated.

Carl – I can add the 3 signals to this diagram.

Adam – Ken does this answer your questions?

Ken – Yes, I think so.

CJ – Carl go ahead and add that to 9-14, and add boundary register figure showing the difference for boundary register mode signal.

Adam – I'm in agreement with Carol. When deselected it should obey the TMP bit.

Adam – Why does CLAMP get to hold the segment, and not EXTEST with some deselected segments?

Carl – The entire BSR is deselected during CLAMP.

Adam – I have to go to bypass to get the segments deselected.

CJ – I'm not following. Look at the figure I'm showing.

Carl – You are saying an excluded segment doesn't obey the TMP controller.

CJ – Yes.

Adam – Why? We want the non-selected segments to obey the TMP. Bypass gets me what I want, but EXTEST doesn't.

CJ – This segment is not in test mode.

Adam – When TMP is set you are in test mode.

Carl – If TMP is set the non-selected segments are in test mode.

Carol – Are you saying the power switch has highest priority to say a segment is in test mode?

CJ – I'm picturing very static. Turn on segments with the switch mux. If they are not on I don't want them in test mode. If I do CLAMPHOLD I didn't load any data into those non-selected segments.

Adam – You have the wrong order.

CJ – It's mute if a segment is powered down. The segments not selected are in mission mode.

Adam – I don't know what that segment is doing then. I can load it up and close it down once I have it programmed.

CJ – I think you should use CLAMP for that. I'm weighing

Adam – I'm hinging on TMP and we both get what we want.

Carl – What is ch-mode in this figure? You are making the switch-cell higher priority than ch-mode. I want flexibility to do what I want.

CJ – You are putting cells into test mode that you didn't condition.

Adam – It's like going into EXTEST without preload first.

CJ – Do we need 'mode' and ch-mode' both routed now?

Adam – Is ch-mode already gating mode elsewhere?

CJ – I now can't use clamp-hold.

Carl – We already have this handled in clamp-hold.

Carol – You can have local override of clamp-hold for segments of the boundary register.

CJ – I don't think so for boundary register.

Carol/Carl – Yes. Local control test modes like PRBS.

CJ – We'll have to discuss this more.

Carol/Carl – Agreed.

Adam - I still think we can satisfy both.

Carol – All the time for today, continue this discussion over email.

Meeting adjourned: 10:07am MST (AZ)

Action Items:

- Continue discussion of clamp-hold effects/priority with respect to non-selected register segments of the boundary register.

Next Friday Meeting:

- Next week Friday Oct 28, 2011