

Minutes of IEEE P1394c Working Group Meeting (12/16/2003)

The IEEE P1394c Working Group was hosted by Broadcom in San Jose, CA on Tuesday, Dec. 16, 2003. The attendees were:

Colin Whitby-Strevens	Apple	colinws@apple.com
Michael Johas Teener	Apple	teener@apple.com
Les Baxter *	Avaya	les@baxter-enterprises.com
Kevin Brown	Broadcom	kbrown@broadcom.com
Richard Thousand *	Broadcom	thousand@broadcom.com
John Gildred	Pioneer	john@pioneer-pra.com
Walter Hurwitz	Broadcom	whurwitz@broadcom.com
David James	JGG	dvj@mit.alum.edu
Dwayne Escola *	Panasonic	descola@psdc.com

Those identified with an * attended via conference call.

Agenda:

- 1) Welcome and introductions
- 2) IEEE Patent Policy – Chairman Michael Johas Teener reviewed the IEEE's patent policy.
- 3) Approval of Minutes from November meeting – approved by acclamation.
- 4) Review of old action items
- 5) Sync-E
- 6) Autonegotiation
- 7) Suspend Mode
- 8) Next Meetings

Previous Action Items:

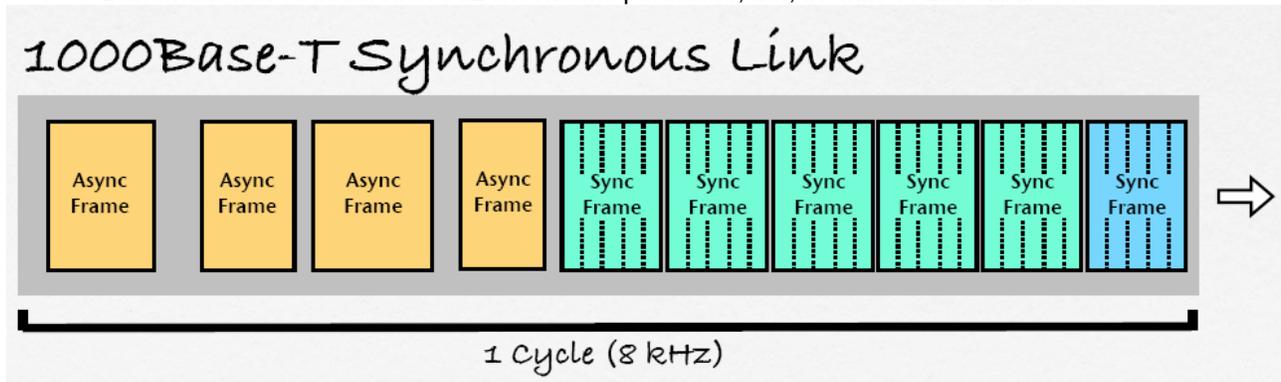
- 8) Colin – run the error simulation without the robust encoding and compare to the current results. – Simulation was run but the data is not fully analyzed yet. (Still open)
- 9) Walter Hurwitz – evaluate the impact of using a new Selector Field instead of MC9 in the autonegotiation process. (CLOSED – see the Autonegotiation section below.)
- 12) Colin – investigate issues involved with supporting combined S800-T/S100-T ports. (Still open)
- 13) Walter Hurwitz – invite the Gibson/Pioneer guys to our next meeting. (CLOSED – John Gildred of Pioneer attended today's meeting – see the Sync-E section below.)
- 14) Kevin Brown – probe the 802 chair about the status of our liaison request. (CLOSED -- Paul Nikolich recommended Bob Grow as the liaison.)
- 15) Walter Hurwitz – look at how we could use the OUI to simulate MC9 operation. (CLOSED – see the Autonegotiation section below.)
- 16) Michael Johas Teener – get permission from the MSC to use their OUI as a identifier for a universal autonegotiation method. (CLOSED -- Bob Davis gave his ok.)
- 17) Kevin Brown – review the low-power mode that is in the current 1394c draft and make proposals for modifications (CLOSED, see the Suspend Mode section below)
- 18) Kevin Brown – investigate whether we can go straight to PAM-5 signaling on exiting from suspend mode, or if an interim state is required to make sure the master signals first. (CLOSED – see the Suspend Mode section below)

Sync-E

John Gildred of Pioneer gave a summary of the Sync-E project. John distributed two documents which will be posted to the P1394c web site – an overview presentation and Draft 39 of the Synchronous Ethernet document.

Sync-E is a “method of synchronizing frame distribution across an Ethernet LAN without compromising compatibility” with legacy equipment. Sync-E has a very low latency and does not support synchronous mode at Ethernet speeds below 1 Gb/s. It was described as a “low cost solution for an expensive problem.” Some of the key points:

- Uses an 8 KHz cycle, the front of each cycle is packed with synchronous frames, async frames are transmitted later in the cycle.
- Synchronization can be forwarded from the System Timing Master (STM) to other switches.
- Bandwidth can be reserved in 32-bit chunks per frame, i.e., in units of 256 Kb/s.



There was a lot of discussion about a number of issues, including how to set up and manage synchronous connections, latency through the switch, selecting the STM, interactions with legacy systems, etc. It was noted that the Sync-E switch looks a lot like a 1394.1 bridge.

The Sync-E folks plan to do a CFI at the next IEEE 802.3 plenary. It was suggested that 802.3 might not be the best committee since this proposal does not change the MAC or PHY.

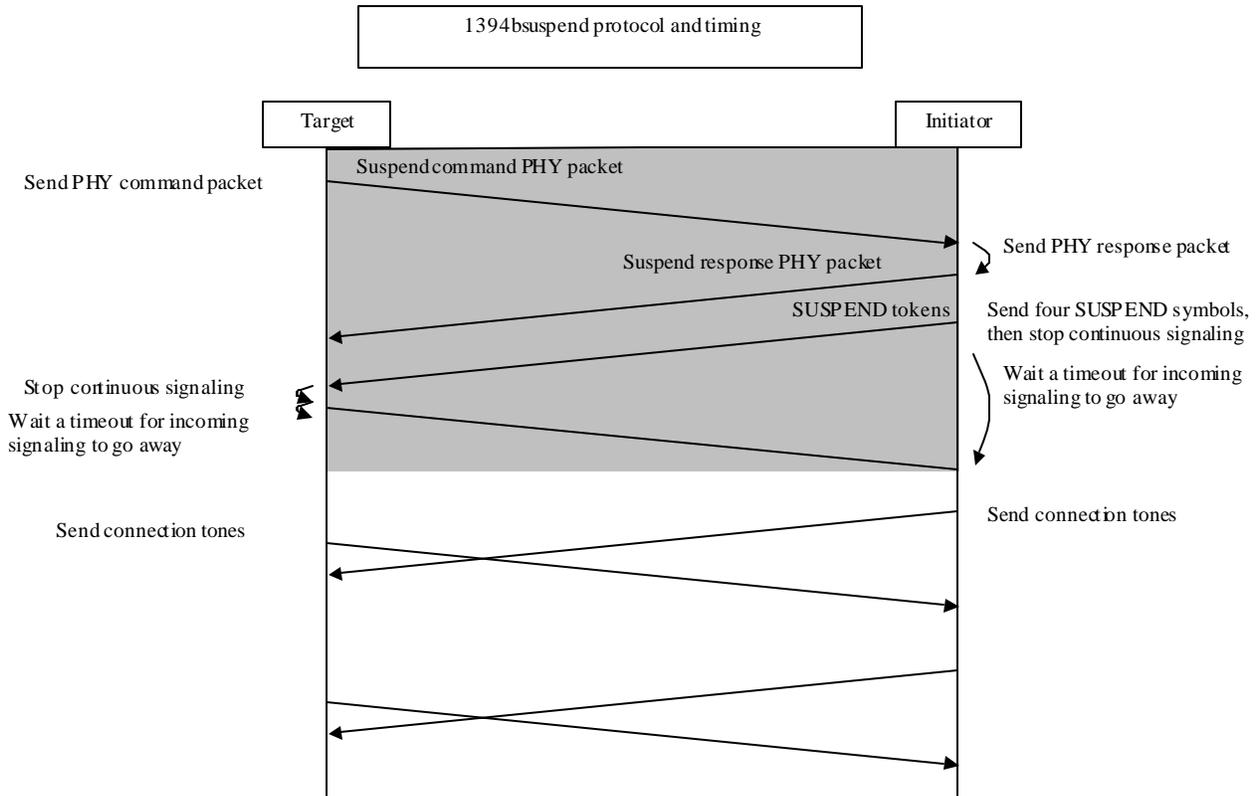
Suspend Mode

Kevin Brown presented a modification of the Alternate Pair Link Pulse (APLP) method for entering and exiting suspend mode. Instead of using normal link pulses for the APLP's, fast link pulses will be used. All 0's will be sent to enter suspend mode and all 1's will be sent to exit suspend mode. This avoids any chance that legacy 10BASE-T equipment may be confused by seeing NLP's on the wrong pairs.

Another question from the previous meeting was whether we can go straight to PAM-5 signaling on exit from suspend mode, or is an interim state required. The conclusion is that the Master can exit suspend mode and go directly to PAM-5 signaling, while the Slave end must send APLP's as described above. Then the Master will initiate PAM-5 signaling.

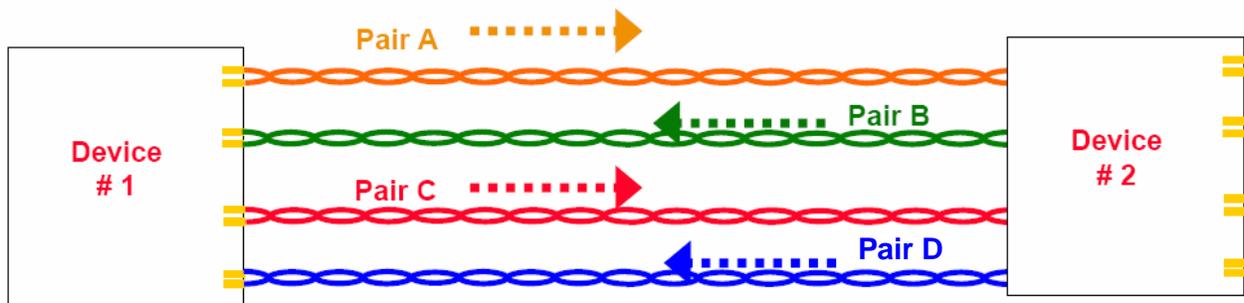
There was some discussion about interaction between new GbE PHYs which support suspend mode and legacy PHYs which don't. It appears that is necessary to include this capability in the autonegotiation procedure so that one end doesn't go into suspend mode unless both ends support it.

There was a request to provide a diagram showing the timing constraints for entering and exiting suspend mode – similar to the 1394b diagram (see below) provided by Colin Whitby-Stevens.



Autonegotiation

Kevin reviewed the various options for autonegotiation, including the use of MC-9, the use of a different selector field, and the use of the OUI message (MC5). There are some suboptimal features to all these techniques. Broadcom proposed a new autonegotiation technique that uses currently unused pairs to autonegotiate other capabilities in parallel (analogous to the use of APLP's for suspend mode signaling.) As shown in the diagram below, standard 802.3 autonegotiation can be done on pairs A and B while autonegotiation of other capabilities (such as 1394) can be done in parallel on pairs C and D.



One issue with this technique is that it would not be possible to build an S800T interface with existing GbE PHY chips. This proposal has not been discussed with the 802.3 community yet. There was a consensus that is a very promising proposal and we should proceed in fleshing it out further.

Both of the Broadcom presentations will be posted on the P1394c web site.

New Action Items:

- 19) Kevin Brown– contact Bob Grow regarding establishing a technical liaison with 802.3.
- 20) Michael Johas Teener – schedule a P1394c tutorial presentation at March IEEE 802.3 plenary (Orlando, FL, March 14-19, 2004)
- 21) Richard Thousand – specify timing diagram and constraints regarding entering and exiting suspend mode.
- 22) Walter Hurwitz – proceed with more details on the Pair C/D autonegotiation proposal.
- 23) Michael Johas Teener – formally request the assignment of a 1394 selector field from 802.3.
- 24) David James -- Send a note to the 802.3 maintenance group to clarify the bit-ordering of the OUI message.

Next Meetings

The schedule for the next 2 meetings was confirmed.

- Monday, Jan. 19, 2004, 8:30 – 12:30, in conjunction with the 1394 TA Meeting (Kona, Hawaii)
- Tuesday, Feb. 17, 2004, 10:30 – 3:30, hosted by Panasonic (550 Winchester, San Jose CA)

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