

Bridges Working Group
May 23, 1996
San Jose, CA

The meeting was called to order at 9:30 AM by Dick Scheel, the provisional chair of the working group. As is customary, the participants introduced themselves. The attendance is attached to the end of these minutes.

1. IEEE Procedures

Dick Scheel explained that these are meetings of an as yet unsanctioned IEEE working group. The PAR has been submitted to the IEEE Board of Standards Review, which next meets June 20, 1996, and is expected to be sanctioned at that time.

IEEE considers participants in standards development work to be individuals and not representatives of any organization that employs them.

Dick then proceeded to summarize some of the history of bridge work up to this point in time. A slide handout, "Serial Bus to Serial Bus Bridges", last presented at the April 11 meeting, in Tokyo, of the 1394 Trade Association Architecture working group, was distributed.

Sun Microsystems has agreed to host a reflector for working group discussions, p1394.3@sun.com. The initial subscription list for this new reflector is the attendance list from the meeting. These minutes have been published on that reflector. Bob Snively administers the reflector and should receive all subscribe or unsubscribe requests a bob.snively@eng.sun.com.

2. Bridge Overview

Because this was the first meeting of the working group and because many of the participants come with an untutored viewpoint, Dick made a presentation of the current thinking *in re* Serial Bus bridges, based upon the slides handout. The slides reflect the work to date form the basis of a working document in preparation by the Technical Editor, Peter Johansson.

NOTE: It would be desirable to secure a company willing to host an FTP site for the dissemination of documents. The Chair took this as an action item. In the short term, copies of the slide presentation are available at the 1394 Trade Association world wide web site or by directly contacting Peter Johansson, pjohansson@aol.com. The slides are available in Adobe portable document format (PDF).

Rajeev made the observation that although the standard may leave open many implementation details, *e.g.*, the bridge's switching fabric, there should be implementor's notes to call attention to architectural features that constrain or mandate implementation features.

In the middle of the overview presentation, there was a discussion about routing styles for bridges. Some thought the matter of whether or not the model is "transparent bridging" should be revisited.

***** LUNCH *****

3. Meeting Schedule

The next meeting of the P1394.3 working group is scheduled for Monday and Tuesday, July 29 - 30, in San Jose, CA. Sony will host the meetings which will start at 9:00 AM on both days.

4. Distributed bridges

Dick Scheel summarized the VESA Home Network committee work to date on the concept of distributed bridges. Distributed bridges are architecturally no different from the bridges under consideration by P1394.3; the name was chosen to emphasize the fact that the portals of a distributed bridge are located up to 50 meters apart---rather than being within the same enclosure.

A signaling technology called Hotspur, described by Colin Whitby-Strevens, could be used as the internal bridge fabric in the form of two half-duplex bit pipes that connect the portals of the distributed bridge. Hotspur could make use of either unshielded twisted-pair, class 5, (UTP-5) or plastic optical fiber (POF) to make the connection.

Although the signaling, link and transaction protocols used between the two portals does not need to be standardized by this group, Colin raised the possibility that P1394.3 consider this as a work item.

5. Miscellaneous issues

During the day's discussions, a number of key observations were made that were not necessarily germane to the immediate discussion topic. These questions and observations shouldn't be lost, so here they are.

- * At present, LINK cores for use in bridge portals require custom features not available in standard chipsets. For example, because of the time constraints for the generation of an `ack_pending` for an asynchronous packet to be forwarded by the bridge, the LINK hardware needs to have routing tables available. In the simple model, the registers are small in number: a lower bound and an upper bound for `bus_ID` comparison. Perhaps this sort of routing or address checking capability might be worthwhile in standard LINK designs. This would enable the construction of bridges from off the shelf components.
- * A bridge that completes a write request by a unified transaction to a local node is responsible to synthesize a response packet based upon the type of the acknowledge received from the local node.
- * One of the responsibilities of the bridge manager (which has not been clearly described to date) is that it must enable cycle masters on all Serial Buses. Each bridge portal that propagates the system-wide cycle clock must be root and cycle master on it's locally attached bus. This raises an interaction problem with bus managers on each of these buses. At present, in IEEE Std 1394-1995, a bus manager is free to select any cycle master capable node as root according to its own criteria. Perhaps bus managers shouldn't tamper with the root location as long as the root is cycle master capable.

- * Along the same lines, what happens when you plug a configured Serial Bus into another configured Serial Bus that has a bridge? If the bridge is already established as the root and the cycle master, which cycle master will win out and how will the difference be resolved?
- * Should the bridge manager be a server? For example, an intelligent agent that wished to establish a connection between an isochronous talker on one bus and an isochronous listener on another could allocate all the intervening resources (bandwidth, channels, etc.) in all the bridges and buses. Or this intelligence might reside in the bridge manager itself---and one simply makes an all-in-one request to the bridge manager.
- * What is required to provide a network-wide speed or topology map? Should this reside in the bridge manager?
- * Is there some way to take advantage of high-speed backbone's capabilities if it lies in between lower speed buses? For example, if two S100 devices were talking to each other across an S400 intervening bus would there be some way to permit the packet to be sent at S400 in the intermediate bus?

6. Action items

The meeting concluded with a review of action items.

- * Dick Scheel is responsible to develop by-laws for presentation at the next working group meeting.
- * Dick Scheel is also responsible to develop a proposed schedule for the standards development activity.
- * Peter Johansson is responsible to make the first draft of P1394.3, Standard for High Performance Serial Bus Bridges, available in PDF format by June 28.
- * Rich Mourn is responsible to establish an FTP site for the interchange of technical documents by members of the working group.

***** ADJOURNMENT *****

7. Attendees

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