

Meeting Minutes
1394PWG
December 1-2, 1997
Los Angeles, CA

Chair: Greg LeClair
Secretary: Larry Stein
Editors: Brian Batchelder
Alan Berkema

Attendee	Company
Osamu Hirata	Canon Business Machines
Akihiro Shimura	Canon Inc.
Shigeru Ueda	Canon Inc.
Takashi Isoda	Canon Inc.
Lee Farrell	Canon Info Systems
Greg Shue	HP
Brian Batchelder	HP
Alan Berkema	HP
Henrik Holst	i-data International
Yuji Sasaki	Japan Computer Industry
Jerry Thrasher	Lexmark International
Don Wright	Lexmark International
Frank Zhao	Panasonic
Atsushi Uchino	Seiko-Epson
Fumio Nagasaka	Seiko-Epson
Yoshinori Murikami	Seiko-Epson
Greg LeClair	Seiko-Epson
Randy Turner	Sharp
Larry Stein	Warp Nine Engineering

Proposed Agenda:

1. Administrivia
 - Meeting schedule
2. IEEE 1212 WG Meeting Summary
3. Function Discovery
 - Issues raised in 1212 WG meeting
 - Items to be defined by:
 - 1212 revision
 - 1394 Device Profile
 - How to continue?

4. Printing Profile
 - Review of draft proposal
 - Canon Presentation
 - Epson Presentation
5. IEEE PWG PAR requirement

Additional Agenda Items Requested:

1. Transport Requirements

Minutes:

Meeting called to order at 8:43AM.

Meeting cost \$35 per day.

1. Meeting Schedules

PWG-- January 26-30 Maui, Hawaii

Where: Maui Marriott on Kaanapali Beach
When: January 26, 1998 to January 30, 1998
Rate: \$179.00 double, \$25 per additional
Plus meeting charges

Reservation #: 1-800-763-1333
1-808-667-1200

Group Name: Printer Working Group

DEADLINE: DECEMBER 23, 1997

Be sure to RSVP to lstein@fapo.com with your reservations and list of which meetings you will be attending.

1394TA – January 27-29, Menlo Park, CA

1212 WG – January 30, Menlo Park, CA

2. Transport Requirements

Some issues were left to be resolved regarding the transport requirements.
See Batchelder email from 10/17/97 appended in the annex of these minutes.

2.1 Client Requirements for Thick Transport Stack

Requirements the whole stack to be met at the client interface.

Only issues are listed here. Refer to appended email for complete list.

Musts (issues only):

- Buffer service-

Is this required? Data is received in the same form (packet size) as it was sent. Record mode or Packet mode?

- Directory service

Connections by service name, not socket number.
Keep this as a Must. Explain how it will be used.
Services provided by a given device.
Does the naming service come up before the Transport?
?Should there be a 1394 level directory service?
This may be an issue for the TA.

- Transient link interruptions

List of bus events that need to be managed:

Loop

Disconnect

Bus Reset

Power (link power- Device is powered off but phy is still active)

- Reliability

Do we need to require anything other than the intrinsic reliability of the underlying link?

1394 phy and transaction layers do provide CRC detection. Correction may occur with some error types.

Resolved- The thick transport will not require any additional error detection and correction than that supplied by the lower layers of the stack.

Wants:

- Connectionless service

Ability to send data without opening a connection.

Resolved- Move this to a MUST, but that it may be a parallel protocol to the connection based transport.

- Multicast

Client can send a packet to multiple endpoints, not broadcast.

Make this a WANT for the connectionless transport. It may fall out of the addressing model for this type of transport. See if there is a good application for this.

- Data tagging

Is this required? Similar to out-of-band data in 1284.4. How would this be implemented? Why would you want to do this? Let's break for lunch.

Revisit this at a later meeting.

(Lunch)

- Provide endpoints with fair access to other endpoints

The transport will prevent endpoints from monopolizing the link and preventing other endpoints from access.

- Selectable quality of service

The ability to adjust various quality of service parameters, including:

Isochronous delivery

- Priority
- Propagation Delay
- Rate of transfer (bandwidth)

This needs to be discussed later to determine if there are issues here that need to be addressed.

2.2 Internal Thick Transport Stack Requirements

Musts:

- Data and OS independent

The transport stack shall not put any requirements on the format of the data, nor shall it interpret the data in any way. This standard shall define a set of services that must be implemented on any OS platform via an appropriate application or client interface.

- Provide efficient data transmission

Prevent unnecessary bus traffic (e.g. retransmissions) by not transferring data until that data can be handled by the receiving device. Balance bus traffic with protocol overhead.

Is this flow control? Protocol overhead?

Motherhood and apple pie.

Wants:

- Bus independent transport layer

Would like to make this independent of 1394.

- Reuse existing protocols where ever possible.

3. 1212 Working Group Summary

Greg Leclair provided a brief summary of the the 1212 meeting.

The first meeting of the IEEE 1212 reaffirmation committee was held on November 10-11. These meetings are being held in conjunction with the IEEE 1394B committee.

Key values in 1212:

Existing key: 32 bit field broken into 3 fields:

2	6	24
---	---	----

PROPOSED extended key:

Proposal to add a second key indicated by the value in the 1st quadlet:

2	6	24
8		24

1st quadlet, set 2 bit field to 2Fh (**Greg please check**)

2nd quadlet, set 8 bit field to 00h

24 bit field 000000 - 1FFFFFF => 1212 keys

200000 - 3FFFFFF=> extended keys

Standardized use of textural descriptors

1212 may do some work on this.

1212 December meeting was canceled.
Next meeting of 1212 on January 30.

4. Printing Profile

Review of draft proposal

This is the first draft of the “Imaging Device Communications Profile”.

Epson Presentation

Nagasaka-san made a presentation on using SBP-2 for symmetrical communication.

Please refer to presentation (to be posted on web site).

Decision tree:

Write message (DL_Data.indication)

- The initiator talks to the target

 - DL_Data.indication.from.initiator

 - The initiator informs the target when output data is ready

 - The target informs the initiator when fetch transaction has been completed.

 - The Target talks to the initiator

 - DL_Data.indication.from target

 - The target informs the initiator when the output is ready

 - The initiator informs the target when the write transaction has been completed.

Read Message (DL_Data.request)

- The initiator reads from the target

 - DL_Data.request.to.target

 - The initiator informs the target when input buffer is allocated

 - The target notifies the initiator when write transaction has been completed.

- The target reads from the initiator

 - DL_Data.request.to.initiator

 - The initiator informs the target when output data is ready

 - The target informs the initiator when read transaction has been completed.

Canon Comments on Profile spec:

Akihiro Shimura, of Canon, presented a description of how the High Performance Transport (HPT) could fit on top of a SBP-2 datalink implementation.

Please refer to presentation on the web site.

End of day one.

Day two.

Meeting called to order at 8:38AM by the most honorable chair Greg LeClair.

4 continued - Review of the Printing Profile.

Comments:

A- Is the introduction correct?

Does this explain what the document is intended for? Is this a set of requirements or a specification?

Resolved: This is the specification.

=> **Larry will work with Alan on the introduction.**

B- Is this a specification or an example?

After discussion we decided that we are working on a specification for how to implement function discovery for 1394PWG.

=> **A vote was taken and passed unanimously to change the title of the document to 'specification' rather than a profile.**

C- Generate change bits.

With only 2 bits for configuration then only 4 events can be indicated. The bits are used to indicate that a device configuration or Config ROM change has occurred. Should this only apply to changes in the Bus Info Block?

=> **Keep the generate bits but define how it is to be used.**

D- Figure 1

Is the term "Image Applications" appropriate?

=> **Need to show that going through the 1284.4 box you could go to other interfaces, such as 1284, USB...**

You could go directly to SBP-2, or you could go through another layer that provides the capability to use other interfaces.

E- SBP-2 bi-directional transfer

Reverse Initiator/Target functionality

Requires a change in the host implementations. A device must provide both the initiator and the target sides of the interface.

=> **Should this be full I/T functionality or some limited feature?**

Login Solicitation Register

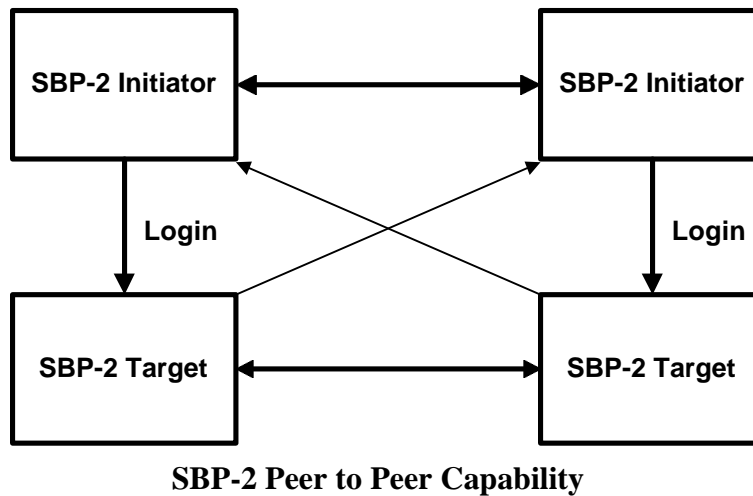
Allows Target to request that the Initiator do a Login in order to provide a peer-to-peer type of functionality.

This would require a change to, or modification of, the SBP-2 specification.

Unsolicited Status

Works with existing devices (?) but requires a Login for each available target. Polled interface.

Do we want this:



F- Section 13. Why SBP-2

A discussion ensued as to whether the SBP-2 is the only datalink suitable for this standard. Two major reasons are:

- It is an existing standard being used by other devices
- It is an efficient transport protocol and is optimized for 1394 DMA shared memory access.

What has not been stated clearly is that a significant goal is to gain support from Microsoft for the implementation of this protocol stack. As SBP-2 is already implemented in the OS for future release, there is a good incentive to use this as the basis for the 1394PWG protocol stack. One thing we need to know is whether the Microsoft implementation is a full and/or compliant implementation of SBP-2. If it is neither, then how would this effect this proposal?

Randy Turner?

G- Section 15, Item 4

What is the value of the timeout? Does this need to be a negotiated value? Should there be an explicit action rather than a passive timeout?

H- Section 14, Multiple Logical Channels

Routing information needs to be provided here, not .4 Channel information.

=> PSID and SSID should be removed from the command_block

MLC should still work over the SBP-2 as long as the DL always has a buffer available.

Task lists may be associated with a single Login. If this can be associated with a single 1284.4 CBT then the fetch agent can simply pass the data to the .4 client.

I- Section 17. Peer to Peer

Needs clearer definition of what is meant by “peer to peer” within the context of this specification.

Conference call to discuss revised Profile spec:
Monday, December 15 at 4:00 PM (EST). Randy Turner will set up the conference call and notify the list with the call in phone number.
Randy, Larry, Greg, Brian, Alan, Greg, Jerry, Nagasaka-San, Shimura-San.

J- Section 19. Command_block ORB
Remove PSID and SSID from the command_block.

K- Status Block
Remove PSID/SSID.
Review the status_codes.

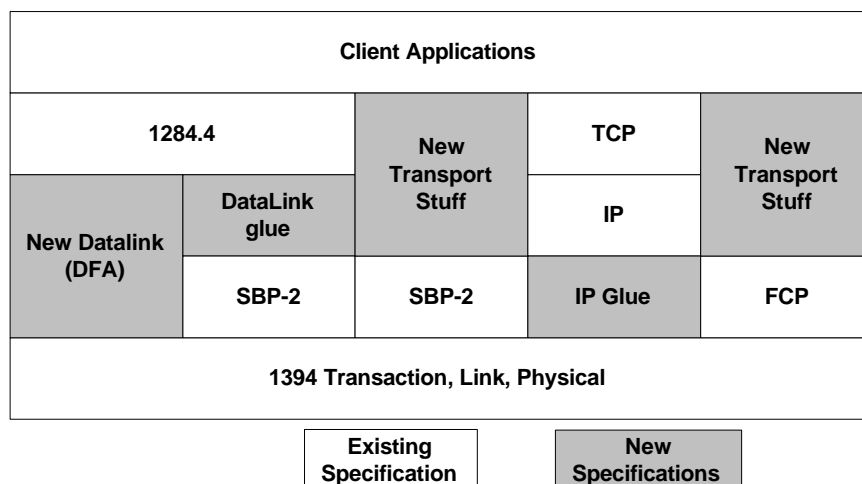
L- Section 23, Reconnection
Item 2 states a timeout of 2 seconds. The SBP-2 standard specifies 1 second. We may want to change this to a longer, human interaction, time. For Async services this may be extended. This is to allow a transport connection to be maintained for some time longer than bus reset events. For example, if someone adds a device in the chain while a .4 conversation is active, the bus reset and re-enumeration may not automatically cause a SBP-2 Logout to occur thus terminating the .4 CBT.

The ORB fetch agent should only pass completed buffers up to the next level. This ensures that partial buffers will not be passed, or that repeat buffers will not be sent, if there is a bus reset while data is getting transferred.

Need to understand how things should work under these types of events:
How are the task lists effected by bus resets?
What are the rules for Abort?
Does this require a packet size negotiation between .4 and the DL?

Part of this discussion comes back to **“Are we looking at the correct transport (1284.4) or datalink (SBP-2) for our requirements?”**

Brian put together the following diagram to indicate the various options we have and what areas would need work, and which exist already.



We would like to maintain one Client interface. We cannot do anything about the 1394 Transaction layer interface.

5. PWG-C Update

Nagasaka-san, Ueda-san

Next meeting will be on December 28. Direct Printing Protocol has been changed from using FCP to a proprietary protocol. Application layer command set. Ueda-san is developing the transport protocol. Matusta (sp) and Panasonic is driving another DPP using AV/C. PWG-C may end up supporting two DPP protocols.

Nakamura-san will have FDS version 0.7 available prior to the next meeting.

6. PAR

We don't think that we are quite ready to write the par at this time. Our study group has until March 1998 to decide.

7.- Proposal

Based upon the discussions at this meeting and the Profile specification, Larry Stein made the following motion:

“That the 1394PWG adopt as its goal the use of IEEE 1284.4 as the transport protocol and SBP-2 as the underlying datalink for the thick transport. Our effort will be to determine the requirements and implementation details for the glue layer between the 1284. If at a later date it is determined that this is not a suitable solution then we will need to make appropriate changes at that time. The suitability of the stack will be determined by gauging it against the requirements document that has been developed and noted in the minutes.”⁴ transport and SBP-2.”

Motion seconded by Alan Berkema. Discussion ensued.

Randy Turner made a motion to table this discussion until the January meeting. His issue is that we did not state ahead of time that there would be a deadline for proposals.

Motion to table seconded by Greg Shue.

Vote to table passed. Motion will be picked up at the January meeting.

Annex:

1. Email posted by Brian Batchelder (dated 10/17/97) regarding transport requirements.

1394PWG - Client Requirements for Our Thick Transport Stack

The following is a list of requirements the client places on the thick transport stack. The requirements are split into two sections: musts and wants. They are intentionally brief, with definitions of terms following each requirement.

Musts

- * Support multiple, concurrent, independent, symmetrical connections
 - Multiple, concurrent - Allows for more than one connection at a time.
 - Independent - Activity on one connection has no effect on other connections.
 - Symmetrical - Either endpoint can open and close the connection, and send data.
 - Connection - well-bounded communication path between two endpoints. The endpoints can be on the same device or on different devices.
- * Provide in-order, byte-stream and in-order, buffer (datagram?) services
 - In-order - Data is delivered to the receiving endpoint in the same order as it was presented by the sending endpoint.
 - Byte-stream - Data is delivered as a stream of bytes. The stream of bytes is not guaranteed to be delivered to the receiving endpoint in the same form as it was presented by the sending endpoint. For example, a stream of 80 bytes of data may be presented as 4-20 byte buffers, but delivered as 2-40 byte buffers.
 - Buffer (datagram?) - Data is guaranteed to be delivered to the receiving endpoint in the same form as it was presented by the sending endpoint. For example, if data is presented in a buffer of 30 bytes, it must be delivered in a buffer of 30 bytes. The transport stack may limit the size of buffers. It does not have to support segmentation and reassembly.
- * Provide a directory service
 - Endpoints on a specific device may be referenced by their service name. This allows connections to be opened without any knowledge of the underlying layer's implementation of sockets, etc.
- * Transparently handle transient link interruptions
 - The transport stack shall handle transient link interruptions without affecting the endpoints. These link interruptions include: temporary cable disconnect, 1394 bus reset, etc. Do we want to provide a service to optionally notify clients when there is a link interruption?
- * Reliability
 - What level of reliability is required by the clients?

Wants

- * Connectionless service
A non-bounded communication path between two endpoints. Data may be sent without "opening" a connection.
- * Multi-casting
Simultaneously sending data from one endpoint to multiple endpoints.
Does this need to be bidirectional? Does it need to be reliable?
- * Data tagging
Data can be tagged as "special data" by the sending endpoint. The transport will indicate to the receiving endpoint that the data is tagged. This is also known as out-of-band data.
- * Provide endpoints with fair access to other endpoints
The transport will prevent endpoints from monopolizing the link and preventing other endpoints from access.
- * Selectable quality of service
The ability to adjust various quality of service parameters, including:
 - Isochronous delivery
 - Priority
 - Propagation Delay
 - Rate of transfer (bandwidth)

Internal Thick Transport Stack Requirements

The following are the requirements the transport stack places on itself.

Musts

- * Be data, application and O/S independent
The transport stack shall not put any requirements on the format of the data, nor shall it interpret the data in any way. The transport stack shall work with any application that correctly uses the appropriate interfaces. The transport shall be implementable under any operating system.
- * Do not preclude concurrent operation of other protocol stacks
Devices may implement and use other protocol stacks concurrently with this transport stack.
- * Provide efficient data transmission
Prevent unnecessary bus traffic (e.g. retransmissions) by not transferring data until that data can be handled by the receiving device. Balance bus traffic with protocol overhead.

Wants

- * Bus-independent transport layer
The transport layer may be used on other busses.
- * Reuse existing protocols
Save time by reusing existing protocols, rather than inventing new ones.

Brian Batchelder

Greg Shue

Meeting adjourned at 4:01PM

Minutes submitted by Larry A. Stein.