# 1394 PWG Meeting

July 5-6, 1999

## 1. Meeting Attendees

| | |
|---|---|
| Takashi Isoda | Canon |
| Nobuhiko Shinoda | Canon |
| Lee Farrell | Canon Information Systems |
| Peter Johansson | Congruent Software |
| Greg LeClair (Chairman) | Epson |
| Fumio Samitsu | Epson |
| Fumio Nagasaka | Seiko Epson |
| Alan Berkema | Hewlett Packard |
| Brian Batchelder | Hewlett Packard |
| Don Wright | Lexmark |
| Stephane Berche | OCE |
| Ben Chun | Samsung |

## 2. Detailed Activity

### 2.1 Administrivia

Don Wright provided details for the next PWG meeting (Joint PWG/PWG-C):

- August 16-20
- Sheraton Anchorage
- 401 East 6th Ave
- Anchorage, Alaska 99501
- Reservations: 907-276-8700 and 800-325-3535 (deadline July 5)

Don also referenced the 1999 schedule for future PWG meetings:

- Sep 27-Oct 1 Denver, CO
- Nov 1-5 Raleigh, NC

  Nov 3-4 W3C AC Boston, MA
  Nov 8-12 IETF Wash DC
  Nov 15-19 Comdex
- Dec 13-17 Los Angeles area

Because of conflicts with the 1394 TA and the W3C Advisory Council meetings, Don requested that the September and November PWG meetings should be rescheduled a week earlier. The new schedule would be:

- Sep 20-24 Denver, CO
- Oct 25-29 Raleigh, NC
- Dec 13-17 Los Angeles area

Don indicated that he plans to discuss a draft of next year's meeting schedule at the August meeting. He requested people to send him suggestions or preferences about future meeting dates—including comments about which dates to avoid.

## 2.2 Agenda

Greg LeClair opened the meeting and provided the agenda topics:

- Agenda Review
- Old Business
  - Previous meeting minutes
  - Review / Update Action Items
- New Business
  - Disconnect Proposal
  - Recovery
  - PnP Findings
  - IEEE PAR Proposal
  - OUI Usage
  - API Issues
  - Requirements
  - Discussion on open issues
- Schedule Review

## 2.3 Previous Minutes

The May Meeting Minutes were accepted as written.

## 2.4 Action Item Status

Greg presented the list of action items from the previous meeting, and assigned a "done/still open" status for each:

- Brian Batchelder will propose a mapping from the API entries to transport operation. OPEN
- Brian Batchelder will write up details on "Please Login to me" (Target initiated communication.) OPEN

Note: A previous presentation related to this topic was given by Nagasaka-san at the Denver Meeting (Oct 97). Interested readers should reference this material.

- Brian Batchelder will publish a spec-ready version of his Service Discovery proposal. OPEN
- Brian Batchelder will send title of 1284 specification to Peter for inclusion in IDT document. DONE
- Brian Batchelder will revise and publish the Requirements document. DONE
- Brian Batchelder will review the 1284.4 end of message bit definition and example to determine if they are applicable to the IDT document. OPEN
- Brian Batchelder will write up mechanism for emulated connectionless services over connections. OPEN
- Brian Batchelder will investigate service name registration. Do we need to be able to differentiate different registration authorities for service ID strings? OPEN

- Alan Berkema will add details to the schedule and publish it. OPEN
- Mike Fenelon will send Peter an example illustrating the use of the EOM bit. CLOSED
- Mike Fenelon will work with Microsoft's Plug 'n' play team to understand what information needs to exist in config ROM to plug 'n' play the device. DONE
- Mike Fenelon will set up a plug 'n' play meeting between the 1394PWG plug 'n' play sub-group and the appropriate plug 'n' play developers at Microsoft. DONE
- Peter Johansson will incorporate Shimura-san's history concept with the signature proposal into the specification. DONE
- Peter Johansson and Shimura-san will define the Reset Connection control operation. DONE
- Peter Johansson will write up more explicit detail on Target behavior for handling Abort Connection needs. OPEN
- Greg LeClair will post on the reflector a proposed PAR based on our original PAR. DONE
- Greg LeClair will announce on the reflector that July meeting is "last call" for proposals. DONE
- Everyone shall review config ROM examples in cfgrom04 and idt_r03 to help group to choose which model to follow in the specification. CLOSED

## 2.5 Disconnect Proposal

Isoda-san led a review of the Disconnect proposal that was submitted by Shimura-san.

Greg LeClair indicated that the first two sections of the proposal don't seem to address exactly when the disconnect takes place. Isoda-san clarified the sequence details: the queue with the final ORB bit set determines when the disconnect occurs.

Is it possible for an Initiator to shut down a T2I queue? Yes.

ACTION: Peter Johansson will add the two explanations for shutting down a queue—Initiator shutting down a T2I queue and Target shutting down an I2T queue.

Greg LeClair was concerned that we might not be able to force the O/S to set the notify bit on particular packets. Peter pointed out that because of the unordered execution model, the O/S will have to set the notify bit or rely on us to tell it when to set the notify bit.

What should happen when a queue is specified that is already in the process of closing (i.e. if the connection is in a "half-closed" state)? Just go ahead and close it—do not treat this as an error condition.

Should the name of a connection change after only one of its queues has been shut down? Or should the name remain the same until both queues are shut down completely (and not release the associated resources)? Peter suggested that the "name" of the connection should change to reflect the current queues that are still open. He feels that this would simplify the Target implementation.

Peter noted that the proposal mixes the terms "connections" and "queues" in some places. He will modify the language to remove any ambiguity before including Shimura-san's Disconnect proposal into the specification.

Peter suggested that Sections 8.4.3 through 8.4.3.2 are not necessary—they are redundant with other sections.

ISSUE: How do you handle shutdowns that are initiated by both ends "simultaneously"? [Section 8.4.3.3 of Shimura-san's Disconnect proposal may be used as a potential consideration for this issue.]

It was noted that the proposal includes reference to a Disconnect Confirmation—but this has not yet been adopted by the group. However, upon further discussion, the group decided that the concept should be included in the specification.

ACTION: Peter Johansson will add the concept of Disconnect Confirmation to the specification, but will rename it as "Release Queue."

It was noted that a Disconnection Confirmation would allow for a re-synchronization of connection "names"—assuming the connection name changes when a single queue is shut down.

## 2.6 Recovery

Isoda-san presented slides on Error Recovery processes. He explained that the processes use the ORB Signature and History Log (context information of ORB execution) concepts for supporting Error Recovery. The two items are used to avoid processing the same request twice. When an ORB is queued by the initiator, the target looks for the new ORB's signature in the history log to determine if this is a new or re-queued ORB.

The presentation included animated sequences that illustrate the process steps for handling various recovery examples. The slides reference steps that are documented in a text proposal submitted by Shimura-san.

During the presentation, it was noted that the re-queuing of ORBs MUST be done in the same order within a queue. Peter suggested that the current "Note" in Section 9.5.6 of the proposed text should be removed and/or modified into a requirement statement.

It was noted that ordering of messages from the SBP-2 layer to the PWG layer is important. The SBP-2 layer must provide completion notification in the same order as it is received from the target. There could be problems if an SBP-2 implementation does not differentiate between an Abort Task and an Abort Task Set. Abort notification must either be for the entire task set, or, if done for each individual task, it must be in the same order as the tasks (ORBs) were presented by the PWG layer to the SBP-2 layer.

ACTION: Peter Johansson will add the implementation assumption about differentiating between an Abort Task and an Abort Task Set into the profile specification.

ACTION: Greg LeClair will confirm with O/S implementers if the SBP-2 implementation will differentiate between an Abort Task and an Abort Task Set.

## 2.7 PnP Findings

Greg LeClair presented his summary of a recent meeting held at Microsoft to discuss PnP support for 1394 PWG devices. He will post a document describing the findings of this meeting.

The summary highlights were identified:

- Propose using 1284 Device ID String
- Define usage of "Class" key for MFP devices
  - multiple values can be assigned
  - order does not imply preference
- Add "ClassInfo" key to identify class-specific information
- Recommend for parallel, USB, and 1394 devices

Brian suggested that the Class and ClassInfo mechanisms are not appropriate for 1394 devices. He believes that 1394 has a better method for supporting this information: Instance Directories. He feels that the 1394 PWG specification should—at most—include a reference to the Microsoft documents that would explain their implementation. It was stressed that if anything was explicitly included in the specification—even as informative information—we would run the risk of it becoming "out of synch" with possible future changes by Microsoft.

Greg suggested that Brian (and others) should respond to the meeting findings on the e-mail reflector.

Peter proposed that the 1394 PWG specification should adopt the 1212r specification as the primary mechanism for binding device information.

[Because the O/S cannot always determine exact (unique) binding for drivers, perhaps this means we *must* provide access to the Configuration ROM? This would seem to create an additional requirement for all OS vendors.]

MOTION: Peter proposed a suggested compromise: If you have a textual description that follows the "LU entry" in the Unit Directory, the descriptor should conform to the 1284 DeviceID rules.

VOTE: The group voted in favor of Peter's motion, 7 for and 1 against.

Brian asked to have the Minutes reflect his reason for voting against the motion: "By loosely defining the string, we not only don't provide a complete solution, but we unnecessarily limit third parties from using that string in a different way if needed for their solution."

## 2.8 PWG-C Liaison Report

Shinoda-san presented the current status of the PWG-C activity.

- DPP 1.0 Interoperability Test April 1-2 in Oiso, Japan
- DPP and Thin Transport Demos in April and June.

Some of the guidelines of the Interoperability Testing were identified:

- The Test is intended as an aid in facilitating the development of DPP compliant products
- The results of the Test are to be kept confidential except by agreement by the respective companies involved
- Participation in the Test in no way indicates endorsement or certification of any products by any of the participating companies or by the DSIWG
- No company names should be used during the Test

- The participant's activities in the Test are performed solely at his/her company's own risk

Test Operation:

- One to One testing in a room
- No company names appeared in the Test
- A "Pre-test" is done to establish basic communication ability
- Test is done pursuant to DPP Interoperability Test Procedure

Within the PWG-C, there are two subgroups that work with the 1394 TA:

- SWG1 (DPP) works with the 1394 TA through the DSI WG
- SWG2 (AVC+) works with the 1394 TA through the AV WG

Three major Protocols now exist for 1394:

- Thin+DPP (peer-to-peer)
- AV/C-FCP (AV)
- SBP-2 (PC)

The PWG-C members are waiting for finalization of the PWG Profile. AVC+ and DPP have become the focusing area for Consumer Imaging Source Products. A clear PC Printing Scope should be visible as well.

Shinoda-san indicated that the Alaska meeting is difficult for the PWG-C members to attend. Better coordination with the 1394 TA schedules is requested. [Because Alan Berkema is a board member of the 1394 TA, it is hoped that this will be achieved next year.]

1394 TA 3rd Quarter Meeting

- Camera Storage Command
- Printer Sub Unit Command
- DPP 1.1 Additional Functions: FTP, Page Table, and FDS
  July 8 DSI Off Cycle in Tokyo
  July 27-29 DSI-WG
- Camera Storage Command
- Printer Sub Unit Command
  July 27-29 AV-WG
- Expect positive votes for DPP 1.1
- Expect participation for TA activities
- Major PWG-C members will attend

## 2.9 OUI Usage

Greg LeClair presented a bit of history and the current status on the use of the PWG OUI.

At the Toronto meeting in 1998, the 1394 PWG voted to propose OUI acquisition by the PWG. The PWG approved the plan that was posted to PWG reflector. The OUI was purchased in late 1998, with participation by 12 companies—each paying equal amounts. The OUI has been listed in the CSR and Configuration ROM draft since the acquisition.

The current planned usage for the OUI is as a specifier ID—wherever it is required. The primary usage will be the Command Set ID in the Unit Directory to identify the Transport Command Set.

Greg explained that the plan for OUI usage is to allocate the available 24-bit space into separate partitions for both the PWG and the individual participants. He recommends that 64K numbers be allocated to each of the participants.

Peter Johansson wondered why there would be *any* subset of numbers allocated for individual company use. He felt that doing so was a contradiction with the typical use of OUI numbers.

Greg also suggested the following encoding scheme for Version/Revision:

- <key><Major><Minor>
- Major: 8 bits – '0xFF' reserved
- Minor: 16 bits

Greg identified a few issues that still need to be resolved:

- Should the Firmware_Revision be required, or recommended?
- Is the partitioning of 24-bit sub-id space acceptable?
- What is the preferred encoding for Command Set and Version/Revision entry?
- What is the preferred encoding for Command Set entry in Unit directory?

ACTION: Greg LeClair will post his OUI Usage Proposal for review by the PWG members.

ACTION: The PWG members should re-affirm the allocation and use of the PWG OUI numbers—and respond to the OUI Usage Proposal for voting at the August meeting.

Peter suggested that a "Procedures Page" should be created for describing the process of allocating numbers.

Do we want to identify which companies have which number allocation and make it available to the public?

## 2.10 Non-Blocking Mode

Isoda-san presented some slides discussing the support of non-blocking mode in our profile.

He explained that the Socket API provides two types of operation mode, "Blocking" and "Non-Blocking" on a Socket. According to Isoda-san, the Profile is based on the model that transfers data from or to Initiator's buffer directly to or from target (i.e., Shared Memory Model) inherited from SBP-2.

Both Peter Johansson and Brian Batchelder suggested that some implementations could use a "buffer copy" approach—and the Profile should not restrict the implementation choice.

Isoda-san presented a problem statement:

> To support both Blocking and Non-Blocking modes of "receive()" in the shared memory model, the Initiator needs to know if the target processing would block or not, and the Target needs to know a Watermark value to determine whether to block ORB or not.

→ The current profile has a "*target_data_pending"* bit that may be used to indicate "would block" or not, but it does not have a parameter to specify a Watermark value.

He explained that we need to be able to inform the Target of the socket mode to support more efficient data transfer. (Otherwise, we run the risk of forcing a buffer copy.) To achieve this communication, Isoda suggests that a new control, "Set Transfer Mode" could be defined for use during connect time.

As an alternative approach that would reduce error processing (e.g. receiving a request to change the mode while an ORB is outstanding), Peter suggested using a bit in the ORB.

Isoda-san noted that the issue for the reverse direction might need more investigation. However, after further discussion, Peter convinced the group that the problem is not symmetric.

To help summarize the discussion, Peter suggested a possible encoding for a solution:

Add the following fields to the ORB:
w ("Watermark") bit: valid iff d=1
min_data_xfer: meaningful iff w=1

Complete the ORB as soon as either:
actual data available >= min_data_xfer; or
an error occurs

After a long discussion, it was suggested that the specification should include a statement that if target data pending is set, an implementation should avoid an indeterminate delay for completing an ORB.

After further discussion, the group felt that on a practical basis the min_data_xfer value would only be set to zero.

## 2.11 "Peek" Operation

Isoda-san presented a proposal for a new operation that would allow an application client to "peek" at the contents of the data it will receive, but not affect the data stream that will be received by a subsequent recv() function. The service provider shall not discard the data that it passed to the application through the peek operation.

Isoda-san suggested that a bit in the T2I ORB could be defined for indicating a Peek or Non-Peek data transfer.

Peter Johansson suggested that a more efficient method of the "peek" capability could be achieved by having a "peek buffer" on the transport. This method would avoid sending the data twice.

No one in the group was able to identify a good reason for needing the "peek" capability—other than attempting to support the Sockets Peek capability. It was suggested that the group should consider whether the Peek operation is really desirable and plan for a vote by the next meeting.

## 2.12 IDT_r0x Review

Peter Johansson led a “page-by-page” review of the latest draft of his document Several minor text changes were identified and will be included in the next revision update.

During the review, it was decided that we should not wait for Mike Fenelon to provide an example on the use of the End of Message bit.

Alan Berkema suggested that Section 6 should be moved after Section 8—perhaps as an Annex? Also, he felt that Section 7 should be moved after Section 8.

Peter acknowledged that much of Shimura-san’s proposals (presented by Isoda-san) would be incorporated into a future draft to be published before the August meeting.

The IDT document will change names to PPDT (Peer to Peer Data Transfer Protocol.) Future drafts will be issued under this title.

## 2.13 IEEE PAR Proposal

Greg LeClair led a review of the proposed PAR text. Peter suggested that a different title for the Project should be used: “Draft Standard for a High Performance Serial Bus Peer to Peer Data Transfer Protocol (PPDT)”.

It was noted that the target submission date of September 1 is probably too ambitious.

The group also reviewed some proposed text for Section1 of the IDT document (Scope and Purpose) that was agreed to and will be issued as part of the next draft. Greg will report on the content to the MSC meeting.

## 2.14 API Issues

No progress to report on this activity. Because Brian will be on vacation for the next month, Greg LeClair volunteered to work on this action item to propose a mapping from the API entries to transport operations and the API itself.

## 2.15 Requirements

If Peter discovers anything in the Requirements document that he feels are not addressed in the PPDT document, he will raise the issue(s).

## 2.16 Schedule Review

Alan Berkema reviewed the current schedule status. He acknowledged that the group did not achieve the “design complete” milestone in July. Because of the additional work that still needs to be completed, he suggests that the entire schedule should be shifted by one month, as below:

| | |
|---|---|
| July | Submit PAR to MSC before August |
| August | Design is complete; decide on proposals; close all Issues |
| | [No more proposals after this date!] |
| September | Functionally complete draft |

| | |
|---|---|
| October | First review; discuss prototype plans for interoperability<br>Go/No Go for Ballot? |
| November | Request formation of Ballot Pool to IEEE |
| December | Second review |
| January | Specification is done; final edit review |
| February | Interoperability event |

Nagasaka-san pointed out that the location of the Interoperability event should be selected for convenience of bringing hardware equipment by the participating companies. It was noted that holding the Interoperability test in January might be difficult—because of the 1394 TA and the anticipated location of the January PWG meeting.

The group discussed the possibility of having an additional meeting before the August PWG session. However, coordinating schedules to achieve a draft document two weeks prior to the August meeting proved to be difficult. Instead, everyone with Action Items is encouraged to complete their assignments and submit them to the reflector as soon as possible.

Any proposal that needs to be voted on at the August meeting must be posted to the Website before August 2.

ACTION: Peter Johansson and Greg LeClair will work on integrating the Configuration ROM document into the PPDT document.

## 2.17 Review of Open Issues

The group reviewed the list of Issues:

002 – closed
005 – closed
006 – open
007 – agreed
008 – closed
009 – closed
010 – closed
011 – closed
012a and b – agreed
013 – closed
014 – open
015 – open

## 2.18 Summary of Open Action Items

The following items remain as open Action Items (some of the responsible individuals were reassigned):

========== Previous Action Items ==========

- Greg LeClair will propose a mapping from the API entries to transport operation and the API itself.
- Alan Berkema will write up details on “Please Login to me” (Target initiated communication.)

Note: A presentation related to this topic was given by Nagasaka-san at the Denver Meeting (Oct 97.) It referenced a concept of a Login register. Interested readers are advised to reference this material for further details.

- Brian Batchelder will publish a spec-ready version of his Service Discovery proposal.
- Brian Batchelder will write up mechanism for emulated connectionless services over connections.
- Brian Batchelder will investigate service name registration. Do we need to be able to differentiate different registration authorities for service ID strings?
- Alan Berkema will add details to the schedule and publish it.
- Peter Johansson will write up more explicit detail on Target behavior for handling Abort Connection needs.

========== New Action Items ==========

- Peter Johansson will add the two explanations for shutting down a queue—Initiator shutting down a T2I queue and Target shutting down an I2T queue.
- Peter Johansson will add the concept of Disconnect Confirmation to the specification, but will rename it as “Release Queue.”
- Peter Johansson will add the implementation assumption about differentiating between an Abort Task and an Abort Task Set into the profile specification.
- Greg LeClair will confirm with O/S implementers if the SBP-2 implementation will differentiate between an Abort Task and an Abort Task Set.
- Greg LeClair will post his OUI Usage Proposal for review by the PWG members.
- The PWG members should re-affirm the allocation and use of the PWG OUI numbers—and respond to the OUI Usage Proposal for voting at the August meeting.
- Peter Johansson and Greg LeClair will work on integrating the Configuration ROM document into the PPDT document.

Meeting adjourned.