1394 PWG Meeting

May 24-25, 1999
Philadelphia

Contents

1394PWG Documents & Officers

IDT_r03 was accepted by the committee as the newly merged 1394PWG document.

Alan moved that Peter Johansson become the editor of the 1394PWG. No objections.

Greg LeClair asked the group to make Alan Berkema the vice-chair of the 1394PWG. Lee Farrell seconded. No objections.

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Minutes

No comments on the minutes from New Orleans. Peter moved to accept them. No objections. Accepted as written.

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Issues List

The group chose to review the entire issues list, as this was the first meeting after it was made available.

Greg Shue would like the word "printer" changed to "printing" where appropriate. This change makes it clearer that we are supporting many types of devices that "print", not just printers.

Status
Open = no consensus.
Agreed = consensus solution that is not yet reflected in the official documents of the group.
Closed = consensus solution is reflected in official documents.

Issue changes
961206-001 = Closed
961206-002 = Working Group Issue - Open
961206-003 = Closed
961206-004 = Agreed - Will be merged into 961206-006 (Requirements)
961206-005 = Open - Change to "What accredited standards organization will publish the 1394PWG document(s)?"
970514-006 = Open - Change to "Is the requirements document up to date?"
970514-007 = Split into two issues - "What are the CSR and config ROM requirements for a device using the 1394PWG transport protocol?" and "What are the CSR and config ROM profiles for a printing device?"
970514-008 = Closed. Terminology reflected in IDT_r03
970514-009 = Open
970514-010 = Closed. In the future we will not record the intent to produce "proposals"
980126-011 = Working Group Issue - Open
980302-012a = Agreed - Absent any objections by next meeting, it will be closed.
980303-012b = Agreed - Absent any objections by next meeting, it will be closed.
980518-013 = Agreed. Has been rolled into current document.
980817-014 = Open. Need an interoperability czar.
980928-015 = Open. Continued to be worked on independently of IDT document. Will be merged when stable.
980928-016 = Closed. New officers have been elected.
990128-017 = Closed. IDT is merged document.

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IDT_r03 Review

The group reviewed Peter's newly merged document, IDT_r03.pdf.

The specification was edited "on the fly", so not all changes were captured in these notes. Peter captured a detailed list of his action items related to the spec.

There was discussion around figure 7 on page 13. The relationship of active task set and queues is a difficult one to explain in a drawing.

The definition of the final bit needs to allow for the reissuing of the final ORB after a bus reset.

There was a lot of discussion regarding the meaning of the "following" ORB in the queue. We all understand what it means but we need to be sure to communicate it accurately.

There was much discussion surrounding the definition of the *residual* field. The group was able to understand and agree upon the definition after a verbal explanation. The explanation in the document needs to be reworked.

The new parameter, QUEUE_INFO, needs to be defined. It may be several bits, or possibly one byte, per queue. Only queues from 0 to the highest queues in use need be reported.

The group agreed to mandate a Master Keyword Leaf in the root directory of Config ROM. The Master Keyword Leaf is a 1212r concept, and the 1212r group is considering mandating it anyway.

The group decided that we cannot mandate 1K block reads for all devices. We do mandate 64-byte block reads.

The inclusion of the DeviceID in the feature directory caused a lot of discussion regarding the need for the DeviceID. We analyzed the fields of the DeviceID used by Plug 'n Play. We decided to make the DeviceID optional pending the outcome of the plug 'n play sub-group (see below).

1284 Plug 'n Play Fields that are used by Microsoft
Mfr, model are used to select the driver
Desc, if present, is used for the UI
Class is used to specify specific enumerator (at least it is documented that way - some belief it isn't actually used)

The service_ID leaf under the feature directory is optional.

There was so much discussion around plug 'n play that Peter proposed a new sub-group to work on defining plug 'n play for various operating systems. Mike Fenelon, Laurie Lasslo, Greg LeClair and Lee Farrell volunteered.

We created short definitions for each keyword in our list. Some of the keywords were removed or changed.

Unit Directory
Reconnect time-out was recommended to be at least 10 seconds. This number is a rough stab as to the minimum length of time we think our connections should survive before reconnected.

We decided that the device type shall be 0x1F (Command set-dependent) as the device type is more thoroughly defined in the instance and feature directories.

Brian proposed the elimination of datagram mode, as he believed it would be unused. Alan pointed out that SNMP uses datagram mode. After discussion, the group decided to delay any action pending revisiting the requirements document.

The group discussed the level of detail of the config ROM examples in Annex D. Greg LeClair had generated some very complete examples of several devices. Peter generated simpler examples of each directory type in config ROM.

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Agenda Review

We reviewed the agenda for the following day and ended up with:

- Milestone Discussion
- Requirements Review
- New proposals

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At this time, the group adjourned for the day. The group reconvened the following morning.

Discussion of Extended Reconnect

After the previous day's meeting adjourned , Mike Fenelon asked Georgio C. at Microsoft to describe the operation of the MS 1394 layer reconnect code. It appears that the published SBP-2 extended reconnect hold time-out is not implemented. The MS code instead appears to hard-code 1 second, even if the target will support a larger value.

Peter noted that 1394PWG devices need an API entry into the SBP-2 layer so that the application (in this case, the 1394PWG driver) can ask for a higher reconnect hold time-out. If the initiator doesn't support the extended reconnect hold mechanism, 1394PWG devices may not work "well".

It was noted that the value is limited to an integral power of 2, so yesterday's recommended minimum value of 10 seconds for *reconnect_hold* is not possible. The new recommended minimum value is 8 seconds (2^3).

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Review of Open Issues

-002 - Define Data Format

The group discussed this working group issue. It will remain open, renamed "Define Common Data Format". The action item is to discuss whether or not to define a minimal common data format.

-005 - Publish Specification

Peter proposed that the fastest way to get to a standard would be to get a project authorization from the IEEE. It was asked if an IEEE standard can refer to an ANSI standard (e.g., SBP-2). It can. We were an IEEE study group for a year. It seems that standardizing the reliable data transport we are implementing on top of SBP-2 would make sense.

We will discuss this further on the reflector.

Peter explained T10. It is a standing group. Work on a T10 standard can occur anywhere (e.g., in PWG). A member from each company needs to attend the every 2 month T10 meeting for voting.

-014 - Interoperability Testing

What are we testing?

- Config ROM - As defined by IDT specification
- SBP-2 functionality used by our specification (e.g. login, reconnect, page tables, etc.)
- Operation of 1394PWG protocol

How do we test?

- Model after other interoperability tests (IPP, DPP, etc.)
- Select high-level tests that cover low-level functionality

- Get together at a particular place and time
- We need an "Interoperability Czar" to manage the testing process. No one volunteered.

-015 - SPI

Should this be an informative annex or not? Delay decision. Shall not delay publication of specification.

Action items:

- Add any missing functionality (datagrams?)
- Add mapping from API entries to transport operation
- Review

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Requirements Document Review

The requirements document was last updated in March of 1998.

We want to rename the transport. "Peer-to-peer Data Transport" (PDT) was proposed.

Switching his position from the previous day, Brian proposed moving "connectionless" from a want to a must. Kept as an issue pending further discussion.

We need to add a requirement for returning the list of services (service names).

Other changes were made directly to the Requirements Document, which will be published in a revised version.

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Scope of our Solution

We discussed briefly the scope of the solution we wish to deliver.

- Device / Function Discovery
- Service Discovery
- Connection / Data Transfer

We wondered what parts of this solution were included in our original PAR

Peter would like to see a model for interoperability between two devices using our solution. He would prefer not to separate the pieces of the solution at this time.

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Schedule

Alan presented his proposed schedule for the Peer-to-peer Data Transport specification.

Date	Deliverables

5/99	Merge and agree upon document candidate. Discuss issues
7/99	Design complete Decide on proposals Close issues
8/99	Functional complete draft
9/99	First review of draft Plan interoperability testing
11/99	Second review of Draft
12/99	Spec done after final review
1/00	Interoperability event

This schedule does not include the time required to publish specification via a standards body.

There was general agreement as to the milestones. Alan will maintain and add details.

Lee asked if a document update step needs to be added after the interoperability event, as there will no doubt be problems discovered during testing. The 12/99 deliverable is really spec "stabilized". The spec becomes "done" sometime after interoperability testing is complete.

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Proposal - Lost ACK /NAK

Akihiro Shimura presented a proposal on the process for dealing with lost ACKs or NAKs. This issue was first raised at the New Orleans meeting.

SBP-2 leaves missing ACK recovery mechanism to higher-level protocol (see Annex E)

Status block ACK for ORB is used to discard entry in ORB history log.

On T2I queues, if the ACK is lost, the queue will enter into a dead state. The initiator must do something to the target to get the queue to continue.

Shimura-san proposed that the initiator needs to post a succeeding NOP ORB for the target to complete. This completion will imply that the previous ORB was completed. Peter pointed out that in this case it is OK if the queue blocks, so the NOP ORB is not necessary.

Peter believes that the problem can be fixed with detailed documentation. The next release of the IDT document will attempt to do this.

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Presentation - Interoperability problem with "notify bit issue"

Takashi Isoda presented a clarification on the notify bit issue.

ORBs are no longer required to set the notify bit, so status blocks may not be written. This causes several potential interoperability problems.

- Since the target doesn't tell the initiator the status of each ORB, the target can get ahead of the

initiator. The initiator won't be able to give round-trip delivery notification to its client until the target eventually writes a status block for this queue. It is also important to write status blocks for a number of interesting conditions and errors (basically, anything other than "all data was transferred successfully"). Since it will receive status blocks if an unusual condition occurs, the initiator may report round-trip successful delivery notification to the client when it receives a status block for a future ORB in that queue.

- When the final bit is set, there won't be any further ORBs on this queue to send status. Therefore, the notify bit must be set on all ORBs in which the final bit is set.

It turns out that the only status value that is OK not to write is the one with the final 2 quads equal to 0.

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Proposal - Service Discovery

Brian Batchelder presented a proposal for the 1394PWG service discovery mechanism.

He also discussed the "Service Directory." He reviewed several details already in the specification, and explained that the Directory provides a list of services supported.

Brian explained that the transmission of a large Service Directory can use multiple ORBs with the end of message bit sent on the last ORB.

Brian will revise, enhance and publish a spec-ready version of his Service Discovery proposal.

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Presentation - Consideration of Reset Connection

Akihiro Shimura presented.

Functionality of Reset Connection aborts all outstanding deliveries and resynchronizes each end of the connection to the initial state. It is used after bus reset. It is similar to an abortive shutdown of the queue(s) followed by a connect.

Issue: What happens if one end issues a Reset Connection at the same time as the other end issues a Shutdown for the same connection?

Shimura-san questions the value of Reset Connection. Is it fair enough to grant contiguous resource preservation on resetting connection over new connection?

Peter and Shimura-san will discuss this further and present a new proposal.

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Proposal - New Datagram Mechanism

Brian presented some slides on a new mechanism for Datagram Service.

Datagram Services are typically unreliable, connectionless message services. UDP is a typical datagram service; SNMP is an application that uses such a service. He identified functions in a

datagram API.

Although "connectionless" can be emulated using connections, there is undesirable overhead, unnecessary resource usage, and it is not clear when a queue should be "torn down." [However, it was not clear that these problems are significant.]

Brian proposes that the connectionless service could be put on a separate, reserved Queue.

He suggests using a new control: TransferDatagram (serviceID, datagram).

Essentially, if an ORB is available and the datagram fits, use it-otherwise "lose it" into the bit bucket (i.e. unreliable.) Similarly, if a necessary buffer is available, deliver as much of the datagram that fits-otherwise "lose it" into the bit bucket.

It was noted that Brian's proposal might need to include an additional parameter for the source address.

Datagrams could be emulated across connections, and Peter wondered if the cost of using a separate queue per datagram "connection" was really significant enough to warrant a new mechanism.

Brian will propose connection-oriented emulation of connectionless datagram services.

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Completed Action Items

- Alan Berkema and Peter Johansson will integrate the Chapter 8 drawings (in Profile Document) for the Target and Initiator and provide an update by the next meeting. - Done
- Shimura-san will write up a proposed set of rules for defining behavior when the notify bit is not set - completed by Isoda-san
- Shimura-san will investigate what happens if an ACK or NAK is lost (under all possible conditions)? How can we make sure that we can get resynchronized correctly? - Done
- Brian Batchelder will investigate what happens in non-blocking mode RECV() if no data is available? - Done and posted on reflector

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Open Action Items

- Brian Batchelder will propose a mapping from the API entries to transport operation.
- Brian Batchelder will write up details on “Please Login to me” (Target initiated communication.)
- Brian Batchelder will revise, enhance and publish a spec-ready version of his Service Discovery proposal.
- Brian Batchelder will send title of 1284 specification to Peter for inclusion in IDT document.
- Brian Batchelder will revise and publish the Requirements document.
- Brian Batchelder will review the 1284.4 end of message bit definition and example to determine if they are applicable to the IDT document.
- 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.
- Mike Fenelon will send Peter an example illustrating the use of the EOM bit.
- 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.
- 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.
- Peter Johansson will incorporate Shimura-san's history concept with the signature proposal into the spec.
- Peter Johansson and Shimura-san will define the Reset Connection control operation.
- Peter Johansson will write up more explicit detail on Target behavior for handling Abort Connection needs.
- Greg LeClair will post on the reflector a proposed PAR based on our original PAR.
- Greg LeClair will announce on the reflector that July meeting is "last call" for proposals.
- All shall review config ROM examples cfgrom04 and idt_r03 to help group to choose which model to follow in the specification.

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Attendees

Lee Farrell, Canon	Peter Johansson, Congruent Software	Scott Bonar, HP
Osamu Hirata, Canon	Greg LeClair, Epson (1394PWG Chair)	Laurie Lasslo, HP
Akihiro Shimura, Canon	Fumio Nagasaka, Epson	Greg Shue, HP
Takashi Isoda, Canon	Brian Batchelder, HP	Jerry Thrasher, Lexmark
Shigeru Ueda, Canon	Alan Berkema, HP	Mike Fenelon, Microsoft

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Brian Batchelder (brianb@vcd.hp.com)

Lee Farrell also contributed to these notes.