

Draft Minutes
T11.3 FC-FS Working Group Meeting
October 10, 2001 – La Jolla, CA
8 AM – 6 PM

A meeting of working group FC-FS of NCITS Technical Committee T11 Task Group T11.3 was held at La Jolla, California on October 10, 2001, in conjunction with the T11 Plenary Week meetings. Attendance at this meeting is tabulated at the end of this document.

1. Opening remarks and introductions: John Scheible

Facilitator John Scheible opened the meeting at 8:00 AM Wednesday, October 10, 2001. He expressed the sympathy of the group to the victims of the attacks on New York and Washington on September 11, and to their families and friends. Then he thanked our host company, JNI, and led a round of introductions.

2. Call for changes to minutes

2.1 AL-2/FS report to T11.3 - 08/09/01 01-428v0 John Scheible
Approved as written.

2.2 AL-2/FS minutes – 8/7/01-8/8/01 01-437v0 Bob Nixon
Action 8.2.14 “Bill Martin to publish 01-287v1 and 01-343v2...” should have been listed under “AL/2 Action Items”
Approved as modified.

2.3 FS minutes – 9/11/01 01-486v0 Bob Nixon
Section 6.6.52 should be deleted. It is detritus from the secretary’s preliminary draft.
Section 8.2.5 should be deleted. It is a closed action item in the carryover action items list.
Approved as modified.

3. Approval of this agenda: 01-493v1 John Scheible
approved as presented.

4. Review of old action items: 01-493v1 John Scheible

4.1 AL/2 Action Items - none

4.2 FS Action Items

**4.2.1 Bob Snively to rewrite 15.5.25-27 to eliminate inappropriate examples using “IU”
(OPENED 5/9/01) (CARRYOVER)**

- 4.2.2 Bob Snively to propose structure for Intermix to the reflector.
(OPENED 5/9/01) (CARRYOVER)
- 4.2.3 Mike Dorsett to rewrite clauses 17.6.7-8 to include class 6 support.
(OPENED 5/9/01) (CLOSED direct to editor)
- 4.2.4 Bill Martin to provide a proposal for the login requirement for every ELS.
(OPENED 5/10/01) (CARRYOVER)
- 4.2.5 Jim Nelson will post the proposed fix to Brocade 18.
(OPENED 7/17/01) (CARRYOVER)
- 4.2.6 Bob Snively will post the concerns about Agilent 006 and 007.
(OPENED 7/17/01) (CLOSED email 9/12/01)
- 4.2.7 Jim Nelson will post the proposed correction to Agilent 005.
(OPENED 7/17/01) (CARRYOVER)
- 4.2.8 Bob Snively will post the required correction to 12.2.2.2.2, item a.
(OPENED 7/17/01) (CARRYOVER)
- 4.2.9 Craig Stuber to provide resolution for JNI 005.
(OPENED 7/17/01) (CLOSED email 9/18/01)
- 4.2.10 Mike Dorsett will provide a proposed resolution for Tivoli-853.
(OPENED 7/17/01) (CLOSED direct to editor)
- 4.2.11 Mike Dorsett (was Jim Nelson) will follow up with Mike Foster to be sure our interpretation of QLogic 145 is correct.
(OPENED 7/17/01) (CLOSED email 9/26/01 from Nelson and 10/02/01 from Foster)
- 4.2.12 George Penokie to publish 01-250v2 to reflect removal of RTIN and the RNID changes agreed at FC-FS Ad Hoc meeting August 7-8, 2001, and present it at the next meeting..
(OPENED 8/7/01) (CLOSED by 01-250v2)
- 4.2.13 Greg Koellner to publish 01-353v1 to reflect the discussion at FC-FS Ad Hoc meeting August 7-8, 2001 and present it at the next meeting.
(OPENED 8/7/01) (CLOSED 01-353v1)
- 4.2.14 Craig Stuber will post his presentation at FC-FS Ad Hoc meeting August 7-8, 2001 on clarifying table 220 as a document and request input via the reflector.
(OPENED 8/8/01) (CLOSED email 9/18/01 from Stuber)
- 4.2.15 Roger Cummings to propose a warning statement and a proscription statement about unnecessary PLOGI.
(CLOSED 9/11/01)

- 4.2.16 Bob Nixon to notify via the reflector that at the October meeting we will choose between a warning statement and a proscription statement about unnecessary PLOGI.
(OPENED 9/11/01) (CLOSED email 9/24/01)
- 4.2.17 Bob Nixon to contact Venkat Rangan to request his proposed text for Rhapsody-003.
(OPENED 9/11/01) (CARRY PENDING RESPONSE CLOSED email 9/24/01)
- 4.2.18 Jim Coomes to propose text for when a port becomes unidentified as part of a general topic of address discovery.
(OPENED 9/11/01) (CARRYOVER)
- 4.2.19 Bob Nixon to forward to the reflector a summary of the private discussion of JNI-002 with Nelson, Ham, Lindsay (email 7/30/01)
(OPENED 9/11/01) (CLOSED email 8/1/01 and 9/24/01)
- 4.2.20 Bob Nixon to contact Mike O'Donnell to request his assistance in resolving Tivoli 456.
(OPENED 9/11/01) (CLOSED email 9/24/01)
- 4.2.21 Bob Nixon to contact Mike Foster to request his assistance in resolving class 6 related issues in Brocade-160, Gadzoox-058, WG-002, Qlogic-121, Qlogic-125, Qlogic-126, and Tivoli-853.
(OPENED 9/11/01) (CLOSED email 9/24/01)
- 4.2.22 Bob Nixon to contact Gary Stephens to request his assistance in resolving class 4 related issues in Qlogic-035, Tivoli-600, Tivoli-604, Tivoli-611, Qlogic-092, Qlogic-120, Boeing-064, and Qlogic-141.
(OPENED 9/11/01) (CLOSED email 9/24/01 CARRYOVER FOR RESPONSE)
- 4.2.23 Bob Nixon to contact Gary Stephens (class 4) and Mike Foster (class 6) to request their assistance in resolving issues in areas of their expertise in Qlogic-085 and Qlogic-088.
(OPENED 9/11/01) (CLOSED Foster email 9/24/01 CARRYOVER FOR RESPONSE Gary Stephens)

5. Scheduled New Business AL-2/AL-3

5.1 Letter Ballot Comment Resolution No Doc Bill Martin

Letter Ballot closed October 8, 2001 48Y-4N-7A-?DNV total of 8 comments. A comment document is being prepared (see 01-540v0).

5.1.1 Change bars

Change bars should not be in forwarded document. ANSI will be consulted. Editor will fix as needed.

ACTION: Bill Martin to consult ANSI on acceptability of change bars.

5.1.2 Figure 12

Typo in description of a transition: Accepted

No initialization shown for acquired ALPA: Carryover.

ACTION: Bill Martin to investigate how to represent initialization of Acquired ALPA

5.1.3 No page footers

There were no page footers. ANSI will remove them anyway, but they may help indicate update history in an updated copy of the specification: Accepted

5.1.4 Need resolution for 2nd FL_Port issue

An open issue with FL_Port failover that can result in loss of access to ports on a loop should have been fixed in this update. Counter: the proposed fix would "break" most existing switch implementations. A warning was judged acceptable. There remained strong feelings about whether the warning should reference "loss of access" or "change of addresses".

ACTION: Bill Martin to provide wording for a warning about change of access to loop devices on change of FL_Port.

5.1.5 Process for continuing maintenance of AL

The comment was not against the amendment, but the T11.3 process. No action was necessary to the advancement of the amendment.

6. Scheduled New Business FS

6.1 Status of FC-FS rev 1.30 01-024v3 Jim Nelson

About 50 comments still open, 30 re RNID, 20 others. Facilitator and editor feel a December return to letter ballot is practical.

6.2 Vote of removal of hunt groups N/A Group

Email from Mike Dorsett / Boeing (forwarded to the T11.3 reflector by Bob Nixon on 8/17/01) strongly supported retaining the feature and volunteered technical expertise (since provided) in resolving issues.

The group present voted on the proposal to remove hunt groups from FC-FS. Rejected unanimously.

6.3 Vote to forbid PLOGI after authentication N/A Group

No written proposal has been provided. There was enthusiastic discussion. Topics of particular interest were relevance of implicit logout and what changes in "configuration" would justify PLOGI. The following wording was developed, and though unsatisfactory, seemed to be in the right direction:

A port shall only send a PLOGI to another port when it is not logged in with that port or has discovered through the use of ADISC or PDISC or name server query that the configuration has changed.

ACTION: Dave Peterson will provide wording for forbidding PLOGI on the reflector for further discussion.

6.4 Request Security Attributes (RSA) 01-245v0 Scott Kipp

Scott proposed a new ELS which allows ports to exchange their security capabilities. There was concern that all of the referenced capabilities are in very preliminary state of definition. The contrary concern is that the security architecture may mature more quickly

than a follow on to FC-FS can be completed. The alternative was proposed was to reserve an ELS code but not define the content in FS. It was uncertain whether a single point or a block was appropriate. A single point was sufficient for the presenter.

Scott Kipp moved and Bob Dugan seconded to reserve ELS code 7Eh for a future security ELS. Approved 17Y-4N

6.5 RTIN and RNID rewrite 01-250v2 George Penokie

George was not certain how to describe what kind of ports RNID can be sent to. The question was deferred until clean up all of FC-FS concerning the terms used to identify types of ports (N_Port, L_Port, etc).

A small change in the wording to clarify the (lack of) requirement for login was accepted.

An email to the presenter appeared to request RNID between E_Ports be documented. The most definitive opinion was that ELSs shall not be sent in class F, so the RNID should be reflected as an SW_ILS rather than used directly.

Resolving a long debate, zero-length common node identification data block is allowed on responses to requests for specific node identification data.

Bob Nixon moved and George Penokie seconded that 01-250v2 with clarification to login requirement be incorporated into FC-FS. Approved with no objections.

ACTION: George Penokie to update 01-250v2 to incorporate clarification to login requirement.

6.6 Name Identifier Formats 01-442v1 Jim Coomes

This had remained open from the last meeting pending materialization of a rumored request to add a format for IPv6 addresses. The request remained immaterial.

The facilitator requested to incorporate 01-442v1 into FC-FS as written. Approved with no objections.

6.7 CS_CTL/Priority Clarification 01-353v1 Greg Koellner

Greg presented a revised proposal to resolve several letter ballot issues. It included changes requested at the last plenary meeting and also it references FSv1.3 section numbering.

The revisions propose making the preemption bit Vendor Unique for classes 2 and 3, where its function is meaningless. This was intended to permit a ULP-specific usage in FC-AE. The most consistent interpretation of the standard seemed to allow a class 3 frame to preempt a class 1 or 6 connection, so the bit was meaningful in those frames.

Some changes were requested to the wording of the requirement in section 9.5.2.2 that the priority be set the same in all frames of a sequence, to remove discussion of "multiple frames".

The requirement that response frames carry the same priority as the frame being responded (added at the last plenary meeting) was questioned by the AE folks, who felt priority needed to be flexible to the needs of the application. One answer related to the needs of FCIP multipathing to consistently route traffic based on priority.

It was moved by Dal Allan and seconded by John Scheible that the statement in 01-353v1 section 9.5.2.2 restricting priority of response frames be removed. Approved 15Y-4N.

The reference to Buffered Class 1 will be removed.

It was moved by Greg Koehlner and seconded by Bob Nixon to incorporate 01-353v1 with changes discussed at the FC-FS ad hoc meeting 10/10/01 into FC-FS. Approved with no objection.

ACTION: Greg Koehlner to update 01-353v1 to incorporate changes discussed at the FC-FS ad hoc meeting 10/10/01.

6.8 Clean Address bit 01-483v0 Craig Carlson

Craig proposed assigning a FLOGI ACC bit allowing a fabric to notify a device logging in that the address it is assigned has not recently been used by a different device. This would allow the device to omit a delay of R_A_TOV that was intended to purge possible traffic to the old owner of the address. The bit would be chosen by the FS editor.

It was moved by Craig Carlson and seconded by John Scheible to incorporate 01-483v0 into FC-FS with modifications to clarify the usage of the bit when the address has not changed, and to allow the editor to assign the bit. Approved with no objection.

ACTION: Craig Carlson to update 01-483v0 to incorporate modifications to clarify the usage of the bit when the address has not changed, and to allow the editor to assign the bit.

6.9 Vendor unique R_CTL from SW-2 01-508v0 Claudio DeSanti

Claudio noted that SW-2 assumes a vendor unique R_CTL value. FS does not. He recommended adding it to FS. There were some arcane discomforts with this solution. On close examination, some felt that Table 15 of FC-FS version 1.30 is broken in other ways: The table is unclear on how many of the "standard" information categories apply to each routing value, all or only those tabulated. The title of table 16 also was claimed to be erroneous.

Suggestion to editor: In table 15, remove columns 3 and 4, leave only the table references in column 2, and remove the resulting redundant rows. Make the formats of tables 16 and 43 consistent with table 54. Move table 16 to clause 11, possibly 11.2.8.1. Delete most of 9.3.3, excepting perhaps an explanation where to find the tables. In all tables, assure there is a row reserving all unspecified types.

ACTION: John Scheible to write the revised tables and text for R_CTL and publish them as a document for concurrent review and incorporation into FC-FS.

After a long discussion and many friendly amendments,

It was moved by Claudio DeSanti and seconded by John Scheible that Routing value Fh shall indicate "extended routing", for which Information Category value zero is vendor unique and all others are reserved. Approved with no objection.

It was informally agreed that extended routing frames will be FT-1 format.

All the above will be incorporated into FC-FS for review.

6.10 Definition of ESP header in FS 01-509v0 Claudio DeSanti

Claudio proposed means to specify that the content of an FC Frame payload is formatted to include ESP content. This would allow for frame-level authentication and privacy using a variety of algorithms. He described the intended format and usage in detail; however, no specific algorithms are being proposed at this time. The request is to reallocate the old security header bit in the frame header to indicate ESP format is present, and to allocate a bit in FLOGI and PLOGI to negotiate the ability to use ESP format frames.

It was requested that this header apply to Extended Link Service and FC-4 Link Service frames. This was viewed as possibly dangerous. Lack of encryption was also claimed to possibly be dangerous. The header will be allowed, but if found dangerous, will be prevented by a later standard or technical report.

It was suggested that this is a large change for an unsettled purpose, and was therefore not appropriate to incorporate at this time. This position and its contrary both had strong support.

It was moved by Dave Peterson and seconded by Roger Rose to reserve DF_CTL bit 22 to indicate presence of a future security header. 17Y-1N

It was questioned why a bit was needed in FLOGI. The answer was that there are some scenarios that need it.

It was moved by Dave Peterson and seconded by Roger Rose to reserve Common Services Parameters word 1 bit 21 in FLOGI, PLOGI and their respective ACCs to indicate support for a future security header. Approved without objection.

6.11 Vendor Specific Login Extension 01-498v0 Dave Peterson

Following up on a previous proposal, Dave presented this revision that detailed the formatting of a vendor specific extension to FLOGI/PLOGI and their ACCs. It proposes a bit in the common services parameters to indicate presence of the extension, a word in the current extended payload to indicate the length of the vendor specific extension data, and the vendor specific extension data following the current extended header. The vendor identification as defined in T10 SPC-2, annex D would occupy the beginning of the vendor specific extension data.

It appears we may be out of space for the requested bit and word in the basic xLOGI format.

It was questioned how a device compatible with prior specifications would respond to presence of the new bit and extended length. The answer was that the vendor would be expected to control the environment. The question was refined to request the proper response to such a frame by a device that does not support it: Should such a device ignore the extension or reject it? The answer was not satisfactory to the questioners.

Alternatives offered were a vendor-specific ELS, or full specification of the proper interaction of a supporting device and one that does not support or has no knowledge of the extension.

Dave volunteered to add the interaction behavior, shrink the length field, use the length field to indicate presence as well as length, and bring back the revised proposal.

6.12 Idle requirement BB_Scr/SC 01-525v0 Bob Kembel

Bob raised two issues:

First, he noted that there is no statement what interframe characters are guaranteed to be received by switch ports, although this is specified for Nx_Ports. This reflects the now-invalid assumption that there is nothing but wire between a switch port and its peer. Now, there may be things such as repeaters, which may have elasticity buffers. He proposed adding a requirement to retain at least two primitive signals (not specifically idles). Wording changes were requested to use new port terminology.

Second, he noted that new interframe primitive signals have been added, but rules for their spacing have not. His proposal was to add a rule requiring transmission of at least two idles before and after each non-idle primitive signal for which no exception has been documented. It is possible that no idles would remain at the receiver. There was some concern that exceptions might be hard to find, especially if they are in other documents. Suggestions were made on how this might be resolved.

There was also concern that both new rules allowed that no idles remain at the receiver. It was recommended that the interframe requirement be at least two not-necessarily-consecutive idles.

ACTION: Bob Kembel to update 01-525v0 to include the recommendations made at the FC-FS ad hoc meeting 10/10/01 and publish it.

The group requested more time to consider the revised proposal before approving it.

6.13 EUI to WWN Mapping 01-531v0 Craig Stuber

Craig expressed the desire and need for standard mappings of EUI-64 into WWN and vice versa. The problem is that 4 bits must be omitted from the EUI in the transition.

Bob Kembel advised that the I/G and U/L bits of an OUI must be zero in this usage, giving two bits. Two more can be "borrowed" from the NAA field of the WWN by assuming any NAA beginning '11'b contains two bits of EUI in its remaining two bits.

Craig will work this up and bring it back for review and possible incorporation.

6.14 Letter Ballot Comment Resolution 01-540v0 Bill Martin

Bill brought back a revision of his comment resolution proposal that added resolution of issues raised earlier in this meeting.

It was moved by Bill Martin and seconded by Jim Coomes to recommend to T11.3 that T11.3 recommend to T11 to accept the letter ballot comment resolution and forward FC-AL-2 amendment 01-287v1 as modified by the comment resolution document number TBD to NCITS for further processing. Approved with no objections.

(TBD was later resolved to 01-540v0)

ACTION: Bill Martin to publish the comment resolutions for 01-540v0 agreed at the meeting 10/10/01

ACTION: Horst Truedtedt to update 01-343v2 to include comment resolutions agreed at the FC-FS ad hoc meeting 10/10/01 and publish it.

7. Unscheduled new FS business - None

8. Review of AL-2/FS action items

8.1 AL/2 Action Items

8.1.1 Bill Martin to consult ANSI on acceptability of change bars.
(OPENED 10/10/01)(CLOSED during meeting)

8.1.2 Bill Martin to investigate how to represent initialization of Acquired ALPA
(OPENED 10/10/01)(CLOSED during meeting)

8.1.3 Bill Martin to provide wording for a warning about change of access to loop devices on change of FL_Port.
(OPENED 10/10/01)(CLOSED during meeting)

8.1.4 Bill Martin to publish the comment resolutions for 01-540v0 agreed at the meeting 10/10/01
(OPENED 10/10/01)

8.1.5 Horst Truedtedt to update 01-343v2 to include comment resolutions agreed at the FC-FS ad hoc meeting 10/10/01 and publish it.
(OPENED 10/10/01)

8.2 FS Action Items

- 8.2.1 Bob Snively to rewrite 15.5.25-27 to eliminate inappropriate examples using "IU"
(OPENED 5/9/01) (CARRYOVER)
- 8.2.2 Bob Snively to propose structure for Intermix to the reflector.
(OPENED 5/9/01) (CARRYOVER)
- 8.2.3 Bill Martin to provide a proposal for the login requirement for every ELS.
(OPENED 5/10/01) (CARRYOVER)
- 8.2.4 Jim Nelson will post the proposed fix to Brocade 18.
(OPENED 7/17/01) (CARRYOVER)
- 8.2.5 Jim Nelson will post the proposed correction to Agilent 005.
(OPENED 7/17/01) (CARRYOVER)
- 8.2.6 Bob Snively will post the required correction to 12.2.2.2.2, item a.
(OPENED 7/17/01) (CARRYOVER)
- 8.2.7 Bob Nixon to contact Venkat Rangan to request his proposed text for Rhapsody-003.
(OPENED 9/11/01) (email 9/24/01, CARRY PENDING RESPONSE)
- 8.2.8 Jim Coomes to propose text for when a port becomes unidentified as part of a general topic of login
(OPENED 9/11/01) (CARRYOVER)
- 8.2.9 Bob Nixon to contact Gary Stephens to request his assistance in resolving class 4 related issues in Qlogic-035, Tivoli-600, Tivoli-604, Tivoli-611, Qlogic-092, Qlogic-120, Boeing-064, and Qlogic-141.
(OPENED 9/11/01) (email 9/24/01, CARRY PENDING RESPONSE)
- 8.2.10 Bob Nixon to contact Gary Stephens (class 4) and Mike Foster (class 6) to request their assistance in resolving issues in areas of their expertise in Qlogic-085 and Qlogic-088.
(OPENED 9/11/01) (email 9/24/01, CARRY PENDING RESPONSE from Gary Stephens)
- 8.2.11 Dave Peterson will provide wording for forbidding PLOGI on the reflector for further discussion.
(OPENED 10/10/01)
- 8.2.12 George Penokie to update 01-250v2 to incorporate clarification to login requirement.
(OPENED 10/10/01)
- 8.2.13 Greg Koehlner to update 01-353v1 to incorporate changes discussed at the FC-FS ad hoc meeting 10/10/01.
(OPENED 10/10/01)

- 8.2.14 Craig Carlson to update 01-483v0 to incorporate modifications to clarify the usage of the bit when the address has not changed, and to allow the editor to assign the bit.
(OPENED 10/10/01)
- 8.2.15 John Scheible to write the revised tables and text for R_CTL and publish them as a document for concurrent review and incorporation into FC-FS.
(OPENED 10/10/01)
- 8.2.16 ACTION: Bob Kembel to update 01-525v0 to include the recommendations made at the FC-FS ad hoc meeting 10/10/01 and publish it.
(OPENED 10/10/01)
- 8.2.17 ACTION: Mike Foster to clarify text in FS re preemption. Secretary missed the details.
(OPENED 10/10/01)

9. Future meeting plans

8 hours at T10 plenary week in November 2001

4 hours at the next T11 plenary week in December 2001.

10. Adjournment (FS WG)

The meeting was adjourned at 6:00 PM Wednesday, October 10, 2001.

11. Summary of approved changes

11.1 Changes to FC-AL-2

- 11.1.1 Comment resolutions in accord with 01-540v0

11.2 Changes to FC-FS

- 11.2.1 Reserve ELS code 7Eh for a future security ELS.
- 11.2.2 RNID/RTIN rewrite in accord with 01-250v3 (when available).
- 11.2.3 CS_CTL/Priority Clarification in accord with 01-353v2 (when available).
- 11.2.4 Clean Address bit in accord with 01-483v1 (when available).
- 11.2.5 In table 15, remove columns 3 and 4, leave only the table references in column 2, and remove the resulting redundant rows. Make the formats of tables 16 and 43 consistent with table 54. Move table 16 to clause 11, possibly 11.2.8.1. Delete most of 9.3.3, excepting perhaps an explanation where to find the tables. In all tables, assure there is a row reserving all unspecified types.
- 11.2.6 Routing value Fh shall indicate "extended routing", for which Information Category value zero is vendor unique and all others are reserved. It was informally agreed that extended routing frames will be FT-1 format. Get proposed text from John Scheible.

- 11.2.7 Reserve DF_CTL bit 22 to indicate presence of a future security header..
- 11.2.8 Reserve Common Services Parameters word 1 bit 21 in FLOGI, PLOGI and their respective ACCs to indicate support for a future security header.

12. Attendance

Company Represented	Last Name	First Name	Email
Adaptec	MacLean	Neil	neil_maclean@corp.adaptec.com
Agilent Tech	Ayalasomayajula	Narayan	narayan_ayalasomayajula@agilent.com
Akara	Wanamaker	Neil	nwanamaker@akara.com
Andiamo Systems	DeSanti	Claudio	cds@andiamo.com
Boeing	Foster	Michael	michael.s.foster@boeing.com
Boeing	Nast	Douglas	douglas.p.nast@boeing.com
Boeing	Wilson	Steven H.	steven.h.wilson@boeing.com
Brocade	Snively	Robert	rsnively@brocade.com
CNT	Morandi	Mike	mike_morandi@cnt.com
Connectivity Solutions	Kembel	Robert W.	kembel@compuserve.com
Crossroads	Tyndall	John	jtyndall@crossroads.com
DDC	Decker	Todd	decker@ddc-web.com
DDC	Glass	Mike	glass@ddc-web.com
EMC	Robinson	Gary	robinson_gary@emc.com
Emulex	Nixon	Bob	bob.nixon@emulex.com
ENDL	Allan	Dal	endlcom@acm.org
Exabyte	Rose	Roger	rogerr@exabyte.com
FSI	Weber	Ralph	roweber@acm.org
Fujitsu	Fitzpatrick	Mike	mfitzpatrick@fcpa.fujitsu.com
Gadzoox	Martin	William R.	bmartin@gadzoox.com
General Dynamics	Pedersen	Robert K.	robert.k.pedersen@gd-is.com
Hitachi	Edmonds	Art	art.edmonds@hds.com
HP	Spasic	Predrag	predrag_spasic@hp.com
IBM	Dugan	Robert	dugan@us.ibm.com
IBM	Scheible	John	jpscheible@aol.com
Inrange Technology	Koellner	Greg	gregory.koeller@inrange.com
Inrange Technology	Paul	Harry	harry.paul@inrange.com
JNI	Stuber	Craig	cstuber@jni.com
Larry Lamers	Lamers	Larry	ljlamers@ieee.org
LSI Logic	Odenwald	Louis	louis.odenwald@lsil.com
McData	Kipp	Scott	skipp@mcdata.com
Medusa Labs / Finisar	Rouse	Jerry	jrouse@medusalabs.com
MTI	Ramos	Rich	rich@chi.mti.com
Pirus	Binford	Charles	charles.binford@pirus.com
Qlogic	Carlson	Craig	craig.carlson@qlogic.com
Seagate	Coomes	James	jim_coomes@seagate.com
Seagate	Suhler	Paul	paul_a_suhler@seagate.com
softbank	Shenoy	VP	vpshenoy@sbvc.com
SRB Consulting	Warden	Gary	gwarden@srbconsulting.com
Sun Microsystems	Moe	Ken	kenneth.moe@sun.com
Tivoli	Penokie	George	g_penokie@tivoli.com
Unisys	Gentry	Wayne	wayne.gentry@unisys.com
Veritas	Cummings	Roger	roger.commings@veritas.com
Vixel	Hirata	Ken	khirata@vixel.com
Vixel	Nelson	James	jnelson@vixel.com