IPS   C. Monia
                                                   F. Travostino
                                                         J. Tseng
Internet Draft   Nishan Systems
Document: draft-monia-ips-ifcplcc-00.txt   April 2002
Category: Informational

                Responses to iFCP Rev. 10 Last Call Comments

Status of this Memo

    This document is an Internet-Draft and is in full conformance with
    all provisions of Section 10 of [RFC2026].

    Internet-Drafts are working documents of the Internet Engineering
    Task Force (IETF), its areas, and its working groups. Note that
    other groups may also distribute working documents as Internet-
    Drafts. Internet-Drafts are draft documents valid for a maximum of
    six months and may be updated, replaced, or obsoleted by other
    documents at any time. It is inappropriate to use Internet- Drafts
    as reference material or to cite them other than as "work in
    progress."

    The list of current Internet-Drafts can be accessed at
    http://www.ietf.org/ietf/1id-abstracts.txt

    The list of Internet-Draft Shadow Directories can be accessed at
    http://www.ietf.org/shadow.html.

Abstract

   This document is a compilation of responses to review comments
   received for revision 10 if the iFCP specification [IFCP] during the
   preliminary last call period from 3/4/2002 to 3/18/2002.

1. Conventions used in this document

   The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
   "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in
   this document are to be interpreted as described in [RFC2119].

   In the following, [E] designates an editorial comment, [T] a
   technical comment.

   The keywords 'Rejected' or 'Accepted' indicate fundamental agreement
   or disagreement with the position stated in the comment.

   The keyword 'Response' is used when a comment is predicated on a
   query. The explanatory text should be consulted for details.

2. Comments from David Black

     Comment 1. [E} Page 5, Change Log

        Remove Change Log in the version after a successful WG Last
        Call.

     Accepted

     Comment 2. [E] Section 2.1, page 7, paragraph 1

        "Terms needed to clarify the concepts presented in this
        document are presented here."

        I don't like the usage of "clarify". How about "Terms used to
        describe the concepts presented in this document are defined
        here." ?

     Accepted

        The text will be revised as suggested.

     Comment 3. [E] Section 2.1, Address Translation Mode Definition

        Some tool has helpfully inserted non-ASCII characters. MS Word
        AutoCorrect is a likely suspect. Hunt all of these down and
        fix them, then discipline the tool severely ;-).

Accepted.

Comment 4. [T] Section 2.1, Definition of FC-4 Layer

"FC-4 - The fibre channel application layer. This layer is functionally equivalent to the TCP/IP application layer."

I don't understand this. Are you equating FC-4 with OSI layer 7? If so, I'm not sure that is correct, and it might be better to leave out this attempted analogy.

Accepted

The definition will be changed to:

"FC-4 - The fibre channel mapping of an upper level protocol, such as [FCP-2], the fibre channel SCSI mapping."

Comment 5. [T] Section 3.2, page 10

a) "Arbitrated Loop -- A series of N_PORTs connected together in daisy-chain fashion. Data transmission between N_PORTs requires arbitration for control of the loop in a manner similar to a token ring network."

That's not a fabric topology, unless the loop is fabric attached, in which case you're in case c), Mixed Fabric. iFCP can't support an FC-AL loop that isn't fabric-attached.

Accepted in part

The terminology will be changed to "fibre channel network topologies". However, like existing FC switch products, an iFCP gateway can emulate an FC-AL loop environment. The gateway does this by representing remotely attached devices as if they were resident on a local loop.

The specification will be modified to describe such configurations. In addition, the following definition will be added:

"Fabric -- From [FC-FS]: "The entity which interconnects N_PORTs attached to it and is capable of routing frames by using only the address information in the fibre channel frame."

Comment 6. [T] Section 3.2, page 11, para 5

"Depending on the topology, the N_PORT and fabric port variants through which a fibre channel device is attached to the network may be one of the following:

"Fabric Topology Fabric Port Type   N_PORT Variant
--------------- ---------------   -------------

```
     Loop               L_PORT                NL_PORT
     Switched           F_PORT                N_PORT
```

```
    Mixed              FL_PORT            NL_PORT
                       F_PORT             N_PORT"
```

I believe the Loop line in this table does not match the other
lines and if so, this is one more reason to leave non-fabric-
attached FC-AL out of this description.

Accepted in part

Since the loop topology can be supported, it should remain in
the table. However, the terminology should be changed per
Comment 5 and the table modified as shown below:

```
"FC Network Topology   N_PORT Variant     FC Network Interface
--------------------   -------------      --------------------

Loop                   NL_PORT            L_PORT
Switched               N_PORT             F_PORT
Mixed                  NL_PORT            FL_PORT via L_PORT"
```

In the case of a mixed fabric, additional supporting text will
be provided.

Comment 7. [E] Section 3.3.1, page 14, para 2

"All switched fabrics must provide the following services:

"Fabric F_PORT server   Services an N_PORT request to access
the fabric for communications.

Change "request" to "requests"

Accepted

Replace special character and reword as follows:

"Fabric F_PORT server -- Services N_PORT requests to access the
fabric for communications."

Comment 8. [E] Section 4.4, page 21, para 2

"As discussed below, an unbounded iFCP fabric may have any
number of switch elements and gateways."

It's not "any", but the limit is a very large number by
comparison to 239.

Accepted

The sentence will be changed to:

"As discussed below, an unbounded iFCP fabric is not limited to
239 switches and gateways."

Comment 9. [T] Section 4.4 - iFCP Fabric Properties

   At some point the need to reuse 24-bit addresses for outbound
   traffic from a single FC link behind an iFCP gateway will be a
   problem. This comment also applies to the second paragraph in
   Section 4.4.2.

Accepted

   A discussion of address re-use issues will be added to the
   spec.

Comment 10.   [E] Section 4.5, page 23, para 2

   "In the iFCP protocol, an N_PORT is represented by the
   following addresses:"

   Change "addresses" to "types of addresses" to avoid implying
   that there's only one alias. Different gateways will assign
   different aliases to the same N_PORT.

Rejected

   The description of an alias will be revised as follows:

   b) "A 24-bit N_PORT alias. The fibre channel N_PORT address
      assigned by each gateway operating in address translation
      mode to identify a remotely attached N_PORT.

      Frame traffic is intercepted by an iFCP gateway and
      directed to a remotely attached N_PORT by means of the
      N_PORT alias. The address assigned by each gateway is
      unique within the scope of the gateway region."

Comment 11.   [T] Section 4.5, pp 24, para 14

   "The mode of gateway operation is settable in an
   implementation-specific manner. The implementation MUST NOT
   allow the mode to be changed after the gateway begins
   processing fibre channel frame traffic."

   Might want to add a MUST that a gateway cannot operate in more
   than one mode at the same time, and a repeat of the (implied)
   requirement that all gateways in an iFCP fabric MUST operate in
   the same mode.

Accepted

Comment 12.   [T] Section 4.6. pp 24, para 2

b) "When interoperating with locally attached fibre channel
   switch elements, each iFCP gateway MUST assume control of
   DOMAIN_ID assignments in accordance with the appropriate

    fibre channel standard or vendor-specific protocol
    specification."

This is ok, but turns up another requirement that needs to be
explicitly stated earlier. Any given FC N_PORT MUST NOT be
behind more than one iFCP gateway. Address Transparent mode
satisfies this because only one gateway can become the
principal switch, so the others presumably shut down, but
Address Translation mode appears to have the potential for
seriously nasty misbehavior unless the "iFCP gateway MUST
become the principal switch" requirement is imposed on it also.
Need to add a sentence or two on how an iFCP gateway can be
assured of becoming the principal switch. Beyond this, the
fact that any Fabric Attached FC-AL loop can have only one FL
port completes the picture, ensuring that a loop can't stitch
two gateway domains together. Requiring the iFCP gateway to be
the principal switch also avoids problems with the gateway
being unable to obtain sufficient Domain IDs from the principal
switch.

Accepted in Part

    For either iFCP fabric type, an N_PORT may be behind more than
    one gateway provided:

    a) One gateway becomes the 'principal switch' and

    b) All gateways attached to a given gateway region coordinate
       the assignment of N_PORT IDs and N_PORT aliases such that
       each N_PORT has one and only one assigned address.

    The above will be added to the specification.

Comment 13.   [T] Section 5.2.2.2, pp 32, para 4

    "The gateway SHALL initiate the creation of an iFCP session in
    response to a PLOGI ELS directed to a remote N_PORT from a
    locally attached N_PORT as described in the following steps.

    a) "Using the D_ID field in the PLOGI frame header, locate the
       remote N_PORT descriptor. If no descriptor exists, the iFCP
       gateway SHALL return a response of LS_RJT, with a Reason
       Code of 'Unable to Perform Command Request' (0x09) and a
       Reason Code Explanation of 'Invalid N_PORT_ID' (0x1F). An
       iFCP session SHALL NOT be created."

    Need to explain why this is ok.

    The answer is that a properly operating FC N_PORT will have

previously issued an FC nameserver query that the gateway
translated to an iSNS query, and hence when it issues PLOGI to
the result of the nameserver query, the iSNS query response
created the required descriptor in the gateway before being

translated to the FC nameserver result. There's an implication
here that remote N_PORT descriptors that result from iSNS
queries translated from FC nameserver queries MUST NOT be
discarded as long as any N_PORT that has issued a query for
that remote N_PORT is logged into the fabric.

Accepted in part

Although a name server query is almost always done in practice
prior to a PLOGI, an N_PORT compliant with [FC-FS] is not
required to do so. For that reason, the specification should
cover the case where a fibre channel device attempts to send
frames to an address without having executed a previous name
server query.

Also, while the policies for remote N_PORT descriptor retention
are implementation-specific, the specification should at least
contain recommendations. In that regard, the following added
text is proposed:

"Remote N_PORT Descriptors should be reclaimed based on a last
in, first out policy.

"An iFCP implementation should have sufficient resources to
insure that a newly created descriptor is not reclaimed before
the referencing iFCP session is created."

Comment 14.   [E] Section 5.2.2.2 - Creating an iFCP Session

e) "If a CBIND response is returned with one of the following
   statuses, the PLOGI SHALL be terminated with an LS_RJT
   message. Depending on the CBIND failure status, the Reason
   Code and Reason Explanation SHALL be set to the following
   values specified in [FC-FS]."

Add a statement that this plus case f) is a comprehensive list
of possible CBIND failure statuses, as specified in Section
6.1.

Accepted

Comment 15.   [E] Section 5.2.2.2 - Creating an iFCP Session

f) "A CBIND response with a CBIND STATUS of "N_PORT session
   already exists" indicates that the remote gateway has
   concurrently initiated a CBIND request to create an iFCP
   session between the same pair of N_PORTs. The receiving
   gateway SHALL terminate this attempt, return the connection
   to the Unbound state and prepare to respond to an incoming

CBIND request as described below."

Add a sentence indicating that the "simultaneous open" race is dealt with by allowing the sender with the numerically larger N_PORT name to succeed in establishing the session.

Accepted

Comment 16.   [E] Section 5.2.2.2, pp 34, para 2

"The gateway receiving a CBIND request SHALL respond as follows:

a) "If the receiver has a duplicate iFCP session in the OPEN PENDING state, then the receiving gateway SHALL compare the Source N_PORT Name in the incoming CBIND payload with the Destination N_PORT Name."

b) "If the Source N_PORT Name is greater, the receiver SHALL issue a CBIND response of "Success" and SHALL place the session in the OPEN state."

Add a sentence indicating that in case b), case c) will occur at the other gateway because N_PORT names are globally unique WWNs, and hence this gateway's duplicate session will receive a CBIND STATUS of "N_PORT session already exists" and will be terminated in due course.

Accepted

Comment 17.   [T] Section 5.2.2.2 - Creating an iFCP Session

There's no discussion of what to do if a TCP connection closes unexpectedly during this process (e.g., if closing of unbound connections is allowed at arbitrary times for reasons such as reducing the resources consumed by unbound connections). This needs to be added even if the reason in parentheses is not allowed.

Accepted

Comment 18.   [T] Section 5.2.2.2, pp 35, para 4

"Upon receiving such a request, the gateway providing the connectivity probe SHALL transmit LTEST messages at the specified interval."

This requires liveness test (LTEST) messages even when the connection is in active use. Was that intended?

Response

The intent is to require LTEST messages at the specified
interval regardless of whether or not there is other traffic.

Comment 19.   [E] Section 5.2.2.4 - Use of TCP Features and
   Settings

   For Wrapped sequence detection, "Should use" in the table
   should be "SHOULD use".

Accepted

Comment 20.   [T] Section 5.2.3.1, pp 38, para 1

   "In response to the Unbind message, either gateway may choose
   to close the TCP connection or return it to a pool of unbound
   connections."

   This assumes that Unbind is always successful. It can fail, as
   documented in Section 6.2. Need to specify how to deal with
   this (e.g., close the TCP connection).

Accepted

   The sentence will be modified as follows:

   "Upon successful completion of an Unbind operation, either
   gateway may choose to close the TCP connection or return it to
   a pool of unbound connections."

   The processing for the failure cases will also be specified.

Comment 21.   [T] Section 5.2.3.1 - iFCP Session Completion

   Can an iFCP gateway reduce the pool of unbound connections
   (e.g., due to demands for resources for other connections),
   possibly by closing them? If yes, need to say so.

Accepted

   A gateway may close an unbound connection due to resource
   demands. The spec will be modified appropriately.

Comment 22.   [E] Section 5.3 - IANA Considerations

   Put this near the end of the document where IANA can more
   easily find it.

Accepted

Comment 23.   [T] Section 5.4.1, pp 40, para 1

   "Protocol#   IANA-assigned protocol number identifying

the protocol using the encapsulation. For iFCP the value is
(/TBD/)."

It's 2 - cite the FC Encapsulation draft's IANA Considerations section as the authority for this.

Accepted

Comment 24.   [E] Section 5.4.2 - SOF and EOF Delimiter Fields

Need to say that the format is specified in the FC Common Encapsulation document and reproduced here for convenience.

Accepted

Comment 25.   [T] Section 5.4.2 - SOF and EOF Delimiter Fields

"SOF (bits 31-24 and bits 23-16 in word 0): iFCP uses the following subset of the SOF fields described in [ENCAP].

This is a problem because these codes are being specified in more than one place. I think the FC Frame Encapsulation document is the right place for the normative specification of these codes (and see my comments against it on the need to get IANA involved). This would be ok as a list of codes that are currently valid, but the specification authority needs to be in one place. Same comment applies to EOF.

Accepted in Part

The specification will be revised in accordance with Comment 24.

Comment 26.   [E] Section 6, pp 46

"LS_COMMAND   For a special link service ACC response to be processed by iFCP, the LS_COMMAND field SHALL contain bits 31 through 24 of the LS_COMMAND to which the ACC applies. Otherwise the LS_COMMAND field shall be set to zero."

There's an LS_COMMAND field in figure 16 and a second one in the iFCP portion of the FC Common Encapsulation header (from Section 5.4.1).

When a single section discusses both fields, as Section 6 does, this gets confusing fast. Please rename the LS_COMMAND field in the iFCP portion of the FC Common Encapsulation header to something like ACC_LS_COMMAND or LS_COMMAND_ACC.

Accepted

The mnemonic will be changed to LS_COMMAND_ACC.

Comment 27.   [T/E] Section 6 - TCP Session Control Messages

     Request   LS_COMMAND Short Name iFCP Support
     -------   ---------- ---------- -----------

     Connection Bind   0xE0   CBIND   REQUIRED
     Unbind Connection   0xE4   UNBIND   REQUIRED
     Test Connection Liveness 0xE5   LTEST   REQUIRED

     [T/E] How do we know that those three values (E0, E4, and E5)
     will not conflict with some future usage by Fibre Channel? I
     think the answer is that SES=1 in the iFCP flags in the header,
     and would be 0 in any future use of these values in an ELS, but
     the use of those three values looks like an attempt to avoid
     conflict and should be explained.

  Accepted

     That is correct. These values were chosen as patterns readily
     distinguishable by a protocol analyzer.

  Comment 28.   [T] 6.2 - Unbind Connection (UNBIND)

     "Unbind Status Description
     ------------- -----------

        0   Successful   No other status
      1 - 15   Reserved
       16   Failed - Unspecified Reason
       18   Failed - Connection ID Invalid
     Others   Reserved

     "Unbind can fail, but earlier specification of the use of
     Unbind (e.g., in Section 5.2.3.1) assumes that it cannot fail."

     Description of how to deal with Failed status needs to be added
     there (e.g., close the TCP connection).

  Accepted

  Comment 29.   [E] Section 7.2, pp 56, para 7

     "For translation type 3, the receiving gateway SHALL obtain the
     information needed to fill in the field in the link service
     frame payload by converting the specified N_PORT worldwide
     identifier to a gateway IP address and N_PORT ID. This
     information MUST be obtained through an iSNS name server
     query."

     This requires an iSNS query for every type 3 translation
     received even if it exists locally in a Remote N_PORT

descriptor. It looks like this was intended due to the
possibility of the descriptor being stale, but I wanted to
check if that was in fact the intention.

Accepted

   The intention was to update a potentially stale entry or force
   the creation of a new descriptor.

Comment 30.   [E] Section 7.2, pp 57, para 3

   "When the ACC response requires iFCP intervention, the
   receiving gateway MUST act as a proxy for the originator,
   retaining the state needed to process the response from the
   N_PORT to which the request was directed."

   That doesn't parse for me. I think the intended meaning was
   that when an ELS request is sent whose ACC will require iFCP
   intervention, the ELS also requires intervention to capture the
   state necessary to process the ACC.

Accepted

   The text will be modified as follows:

   "When the ACC response requires iFCP intervention, the
   receiving gateway MUST intervene to process the response from
   the N_PORT to which the request was directed."

Comment 31.   [T] 7.3 - Fibre Channel Link Services Processed
   by iFCP

   "The following Extended and FC-4 Link Service Messages must
   receive special processing."

   Process question - how does this list get coordinated with T11
   so that it gets updated when T11 defines a new ELS or FC-4 LS
   that requires iFCP intervention?

Response

   The specification must be revised to track the evolving fibre
   channel specifications, including, among other things, the
   addition of new link services that require special processing.

Comment 32.   [T] 7.3.1.1 - Abort Exchange (ABTX)

"Fields Requiring Address Translation	Translation Type (see section 7.2)	Supplemental Data (type 3 only)
Exchange Originator S_ID"	1, 2	N/A

Need to specify how to choose the translation type. This
comment also applies to RES, RES ACC, RLS, RSS, RRQ, RSI, REC

and REC ACC. It may be best resolved by adding additional text
in Section 7.2.

Accepted

Comment 33.   [E] 7.3.1.3 - Discover Address Accept (ADISC
   ACC)

   Should the Command field be 0x20 or 0x02?

Response

   The command field for all ACC response frames is 0x02. No
   change to the specification is required.

Comment 34.   [T] 7.3.1.3 - Discover Address Accept (ADISC
   ACC)

   "Other Special Processing:

   The Hard Address of the ELS originator SHALL be set to 0."

   Doesn't this also require setting the LS_COMMAND iFCP-specific
   field (to be renamed) in the FC Common Encapsulation header?
   This comment also applies to all other ACC's in Section 7.

Accepted

   The specification will be modified accordingly.

Comment 35.   Section 8.2.1 - Enforcing R_A_TOV Limits

   The rules in this section appear to allow forwarding of all
   frames received while in Unsynchronized mode or with a
   timestamp of 0,0. This looks like formula for violating
   R_A_TOV - was this intended?

Response

   The intention was to abort all iFCP sessions and not allow the
   creation of new ones. The specification will be revised
   accordingly.

Comment 36.   [T] Section 9.4.1 - Establishing the Broadcast
   Configuration

   "The broadcast configuration is managed using facilities
   provided by the iSNS server. Specifically:

a) "An iSNS discovery domain is created and seeded with the
network address of the global broadcast server N_PORT. The
global server is identified as such by setting the
appropriate N_PORT entity attribute."

There are no means for recovery from failure, so loss of the
gateway performing the broadcast service results in loss of the
broadcast service. This needs to be explained at a minimum, and
probably corrected.

Accepted

An implementation may designate a local server as a standby
global broadcast server. The local server uses the LTEST
message to determine if the global server is functioning and
may assume control if not.

The specification will be revised accordingly.

Comment 37.   [T] Section 10.2.2, page 82, para 1

"Conformant implementations of the iFCP protocol MAY use such
security definitions."

I don't understand this sentence. What was intended?

Accepted

The paragraph will be changed to:

ôIt is imperative to thwart these attacks, given that an iFCP
gateway is the last line of defense for a whole fibre channel
island, which may include several hosts and fibre channel
switches. To do so, the iFCP gateway must implement and may use
confidentiality, data origin authentication, integrity, and
replay protection on a per-datagram basis. The iFCP gateway
must implement and may use bi-directional authentication of the
communication endpoints. Finally, it must implement and may use
a scalable approach to key management.ö

Comment 38.   [T] Section 10.2.3, pp 82, para 1

"Enterprise data center networks are considered mission-
critical facilities that must be isolated and protected from
all possible security threats. Such networks are usually
protected by security gateways, which at a minimum provide a
shield against denial of service attacks. The iFCP security
architecture is capable of leveraging the protective services
of the existing security infrastructure, including firewall
protection, NAT and NAPT services, and IPSec VPN services
available on existing security gateways."

While this is true of iFCP, iSNS has some serious issues with
NAT and NAPT and iFCP cannot be operated without iSNS.

Rejected

iSNS issues with NA(P)Ts are thought to be resolved (see Section 3.6 in the iSNS specification). iSNS has at least two non-exclusive options to cope with NA(P)Ts, a) the use of FQDNs instead of IP addresses, and b) the option to establish a confederation of iSNS servers and have them doctor IP numbers in transit as part of their mutual confederation contract.

Comment 39.   [T] Section 10.2.4, pp 82, para 1

"iFCP gateways MUST use Discovery Domain information obtained from the iSNS server [ISNS] to determine whether the initiating fibre channel N_PORT should be allowed access to the target N_PORT. N_PORT identities used in the Port Login (PLOGI) process shall be considered authenticated provided the PLOGI request is received from the remote gateway over a secure, IPSec-protected connection."

Need to say something about the IKE identities (ID payloads) used for the authentication, and how they correspond to information obtained from iSNS - NATs/NAPTs will cause issues here. Just requiring an IPsec-protected connection isn't good enough as it may allow a node not registered with iSNS to get in.

Accepted in part

It would be premature to enumerate ID payloads in section 10.2.4, which describes the scope of the overall security design prior to any IKE/IPsec requirement (to follow in sections 10.3). The requested information will be supplied after the last paragraph in section 10.3.1.

Regarding intervening NA(P)Ts between iSNS clients and servers, it is possible to put a proxy iSNS server at the boundary between addressing domains. Such proxy will terminate the IKE/IPSec so that the ID_IPV4_ADDR identity can be used natively by IKE. It is also possible to use the second method described in the response to comment 38 -- a confederation of iSNS servers where the NAT(P)T mediation now occurs between iSNS servers.

Admission control is performed by the iSNS server, based upon the Discovery Domain (DD) configuration information stored in that iSNS server. Once the authenticity of a gateway is verified (e.g., via a pre-shared key) and IPsec SAs are established, then the gateway is trusted to behave according to the specification, which mandates a handshake with iSNS for admission.

Comment 40.   [E] Section 10.2.6   Rekeying

I believe the security draft has changed in this area (small
rekeying interval example), please check it.

Response

   We appear to be consistent with [SECIPS] version 11 still, end
   of section 5.4, when BellareÆs results are taken into
   consideration. Therefore, no change to iFCP is required.

Comment 41.   [T] Section 10.2.7 Authorization

   "Authorization is outside of the scope of this specification,
   and is seen as fully orthogonal to the iFCP security design.
   Such design, however, includes key authorization-enabling
   features in the form of Identity Payload (e.g., ID_FQDN),
   certificate-based authentication (e.g., with X509v3
   certificates), and discovery domains [ISNS]."

   What?? If iSNS doesn't know about an iFCP gateway, that
   gateway shouldn't be able to talk to any other iFCP gateway.
   That's access control, which counts as authorization in my
   book.

Accept

   The paragraph will be re-written as follows.

   ôBasic access control properties stem from the requirement that
   the communicating iFCP gateways be known to one or more iSNS
   servers before they can engage in iFCP exchanges. The optional
   use of Identity Payloads (e.g., ID_FQDNs), certificate-based
   authentication (e.g., with X509v3 certificates), and discovery
   domains [ISNS] enables authorization schemas of increasing
   complexity. The definition of such schemas (e.g., role-based
   access control) is outside of the scope of this specification."

Comment 42.   [E] Section 10.3.2, pp 86, para 8

   If an iFCP implementation makes use of unbound TCP connections,
   and such connections belong to an iFCP Portal with security
   requirements, then the unbound connections MUST be protected by
   an SA at all times just like bounded connections.

   Change "bounded" to "bound".

Accepted

Comment 43.   [T] Section 10.3.2, pp 86, para 9

   "Upon receiving an IKE Phase-2 delete message, there is no
   requirement to terminate the protected TCP connections or
   delete the associated IKE Phase-1 SA. Since an IKE Phase-2 SA

may be associated with multiple TCP connections, terminating
such connections might in fact be inappropriate and untimely.
An iFCP Portal must instead attempt to create a new Phase-2 SA
while there are outstanding iFCP sessions."

That's a problem. If the other side is behaving in accordance
with the next paragraph ...:

"To minimize the number of active Phase-2 SAs, IKE Phase-2
delete messages may be sent for Phase-2 SAs whose TCP
connections have not handled data traffic for a while. To
minimize the use of SA resources while the associated TCP
connections are idle, creation of a new SA may be deferred
until new data is to be sent over the connections."

... and is deleting the Phase-2 SAs because it lacks the
resources to support them, immediately creating a new Phase-2
SA in response to delete messages risks livelock (massive churn
in Phase-2 SA creation/destruction). Creating a new Phase-2 SA
in response to a Phase-2 delete message SHOULD be deferred
until there is traffic to send over that SA.

Accepted

We shall be removing the misleading sentence ôAn iFCP Portal
must instead attempt to create a new Phase-2 SA while there are
outstanding iFCP sessions." and promote from may to SHOULD
prior to the word ædeferredÆ.

The resulting modified text is shown below:

"Upon receiving an IKE Phase-2 delete message, there is no
requirement to terminate the protected TCP connections or
delete the associated IKE Phase-1 SA. Since an IKE Phase-2 SA
may be associated with multiple TCP connections, terminating
such connections might in fact be inappropriate and untimely.

"To minimize the number of active Phase-2 SAs, IKE Phase-2
delete messages may be sent for Phase-2 SAs whose TCP
connections have not handled data traffic for a while. To
minimize the use of SA resources while the associated TCP
connections are idle, creation of a new SA SHOULD be deferred
until new data is to be sent over the connections."

Comment 44.   [E] Section 13. - Normative References

RFC 2451 reference shows up twice.

Accepted

Comment 45.   [T] Section A.2 - Link Services Processed
Transparently

"ACC   Accept"

Is that right? I thought this was intercepted in some cases,
as indicated in Table 6.

Response

   The ACC description will be modified to discriminate between
   the transparent and non-transparent cases.

Comment 46.   [T] Section A.2 - Link Services Processed
   Transparently

   FDISC   Discover F_Port Service Parameters
   FLOGI   F_Port Login
   RTV   Read Timeout Value

   Definitely wrong - the iFCP gateway has to implement these
   itself as specified in Section 9.1.

Accepted in Part

   Special link service messages are those which require
   intervention by an iFCP protocol implementation before they are
   passed to the destination N_PORT. Transparent link service
   messages are passed to the destination N_PORT without such
   intervention. In that regard, the above link services are
   processed transparently.

   The specification will be modified to make the above
   distinction clearer and the section will be re-titled as: "Link
   Services Processed Transparently by the iFCP layer".

Comment 47.   [T] Section A.2 - Link Services Processed
   Transparently

   LINIT   Loop Initialize
   LPC   Loop Port Control
   LSTS   Loop Status
   SCL   Scan Remote Loop

   I don't have time to check these, but I'm suspicious about
   whether anything that has "Loop" as part of its name can/should
   be forwarded transparently into an FC fabric, although SCL
   seems plausible. Please verify whether these are transparent.

Response

   SCL must be processed as a special link service message. iFCP
   will be modified accordingly. The remaining link services
   listed above are transparent.

Comment 48.   [T] Section A.2 - Link Services Processed
   Transparently

```
          RSCN      Registered State Change Notification
          SCN       State Change Notification
          SCR       State Change Registration
```

Those can't be transparent, as [Section 9.2](#) requires the iFCP gateway to implement them.

Response

See response to Comment 46.

3. Comments From Elizabeth Rodriguez

Comment 49.   [E] Title Page, Number of Authors

Looks like you have 8 authors listed. Rule of thumb I think is 6. I am having difficulty locating the guidelines, but may want to consider how you can move a couple of the listed authors into an acknowledgements section of some sort.   With 8, it may or may not get flagged by the IESG...

Accepted in Part

In http://www.rfc-editor.org/policy.html, we fail to see a rule saying that 6 is Ok, and 8 isnÆt. On the other hand, the new policy carries a strong message to limit authorship, and the iFCP authors will seriously consider the option of shrinking authorship further.

Comment 50.   [E] Capitalize Fibre Channel

I believe "Fibre Channel" should be capitalized throughout document.

Rejected

The specification is consistent with T11 lower case usage.

Comment 51.   [E] Acknowledgements

Braces around SECIPS do not match.

Accepted

Comment 52.   [E] [Section 1.2](#)

"NCITS" should be "INCITS".

Accepted

Comment 53.   [E] "About This Document"

There should be a page break before this section.

Accepted

Comment 54.   [E] Definitions, iFCP Frame

Technically, the title is of the comment encapsulation
specification is "FC Frame Encapsulation".

Accepted

Comment 55.   [E] Definitions

In the definitions of "N_PORT Alias" and "N_PORT I/D", two
dashes should be used to separate the term from the body of the
definition.

Accepted

Comment 56.   [E] Section 3, pp 9, para 1

"Fibre channel is a frame-based, serial technology designed for
peer-to-peer communication between devices at gigabit speeds
and with low overhead and latency."

May want to change to gigabit or greater speeds. Technically,
2, 4, 10 gigabit speeds are still gigabit, but many today
interpret gigabit strictly as 1 gigabit.

Rejected

The term 'speeds' implies rates of 1Gb/sec and above.

Comment 57.   [E] Section 3.1

a) "N_PORTs -- The end points for fibre channel traffic. In
   the FC standards, N_PORT interfaces have several variants,
   depending on the topology of the fabric to which they are
   attached. As used in this specification, the term applies
   to any one of the variants."

Suggestion -- sometimes referred to in literature as Nx_PORTs?

Rejected

A parenthetical Nx_PORT digression does not add any value to
the iFCP specification, given that the following statement
claims that N_PORT is used for any such variants.

Comment 58.   [E] Section 3.2, Fabric Topologies

a) "Arbitrated Loop -- A series of N_PORTs connected together
   in daisy-chain fashion. Data transmission between N_PORTs
   requires arbitration for control of the loop in a manner
   similar to a token ring network."

Accepted in part

Rewrite as:

    a) ôArbitrated Loop -- A series of N_PORTs connected together
       in daisy-chain fashion. Loop-connected N_PORTS are referred
       to as NL_PORTS. Data transmission between NL_PORTS
       requires...ö

Comment 59.   [E] Section 3.3, pp 13, para 6

    "FC-4 û- Application protocols, such as FCP, the fibre channel
    SCSI protocol."

    Reword to read: "...such as FCP, commonly used abbreviation for
    "Fibre Channel Protocol for SCSI"

Accepted in part

    The sentence will be revised to read: "...such as the fibre
    channel protocol for SCSI (FCP)."

Comment 60.   [E] Section 3.7, pp 16, par 2

    "The source and destination N_PORT fabric addresses embedded in
    the S_ID and D_ID fields represent the physical MAC addresses
    of originating and receiving N_PORTs."

    "I think the term MAC is inappropriate here -- MAC is really an
    ethernet term. Something like physical world wide unique
    address, similar to an ethernet MAC address... Or ... represent
    the physical MAC like address...

Accepted

    The text will be changed to:

    "The source and destination N_PORT fabric addresses embedded in
    the S_ID and D_ID fields represent the physical addresses of
    the originating and receiving N_PORTs."

Comment 61.   [E] Section 3.8, Fibre Channel Transport
    Services

    Does class 6 still exist, or has it been made obsolete?

Response

    Class 6 is still specified in [FC-FS].

Comment 62.   [E] Section 4.5, pp 24, para 5

    "The mode of gateway operation is settable in an

implementation-specific manner. The implementation MUST NOT
allow the mode to be changed after the gateway begins
processing fibre channel frame traffic."

Does this need to be qualified -- e.g. MUST NOT allow the mode
to be changed after the gateway begins processing Fibre Channel
traffic without first terminating all connections to that
gateway, or some such -- in other words, really someone can
change the mode of operation, but just cannot do so while the
gateway is in use.

Rejected

The specification will not be changed. The intent is to latch
the operational mode after gateway power is turned on and the
gateway begins handling FC frame traffic. A change in
operational mode is not intended to be easy or graceful.

Comment 63.   [E] Section 5.2.2.1, pp 31, para 9

"When creating a descriptor in response to an incoming CBIND
request, the iFCP gateway SHALL perform an iSNS name server
query using the worldwide port name of the remote N_PORT in the
SOURCE N_PORT NAME field within the CBIND payload. The
descriptor SHALL be filled in using the query results."

Need to make sure that iSNS gets through WG last call soon as
well, since this is a normative dependency.

Accepted

Comment 64.   [E] Section 5.4, pp 39, para 1

"This section describes the iFCP encapsulation of fibre channel
frames. The encapsulation is based on the common encapsulation
format defined in [ENCAP]."

The reference to "common encapsulation" should be "FC Frame
Encapsulation".

Rejected

The reference is appropriate.

Comment 65.   [E] Section 6.2, Unbind Connection (UNBIND)

It should be noted that the Unbind status codes listed in this
section are decimal values.

Accepted

The rules for numeric representation will be added to the
"Conventions" section.

Comment 66.   [E] Section 7, pp 53

a) "Transparent û The link service message and reply MUST be
   transported to the receiving N_PORT by the iFCP gateway
   without altering the message payload. The link service
   message and reply are not processed by the iFCP
   implementation."

Since iFCP has Transparent and Translation modes, use of the
term transparent here might get confusing -- Transparent is
referring to the fact that the link service must be propogated
across the IP network, correct? As opposed to a link service
that is applicable only to transparent mode...

Accepted

The term "transparent" in this context will be changed to
"pass-though".

4. Comments from Brian Forbes

Comment 67.   [E] Section 2.1, Special Characters

For some reason the file contains a number of occurrences of
the character <funny character> instead of a hyphen or dash.
Occurs throughout the text.

Accepted

Comment 68.   [E] Section 2.1, Definitions

"iFCP Session - An association created when an N_PORT sends a
PLOGI request to a remotely attached N_PORT. It is comprised of
the N_PORTs and TCP connection that carries traffic between
them."

Grammar: ôit is comprised ofö should be ôit comprisesö.

Accepted

Comment 69.   [E] Section 2.1, Definitions

"N_PORT Alias -- The N_PORT address assigned by a gateway to
represent a remote N_PORT accessed via the iFCP protocol. When
routing frame traffic in address translation mode, the gateway
automatically converts N_PORT aliases to N_PORT network
addresses and vice versa."

Consistency: in the list of 2.1 definitions, some entries use a
double hyphen and others only a single one (which at least one
reader interpreted as a change in level)

Accepted

Comment 70.   [E] Section 3.1, The Fibre Channel Network

"Unlike a layered network architecture, a fibre channel network is largely..."

Remove the extra space after the comma.

Accepted

Comment 71.   [E] Section 3.3.1, Fabric Supplied Link Services

"Time Server û- Intended for the management of fabric-wide expiration timers or elapsed time values and is not intended for precise time synchronization"

Parallel structure: ôand is not intendedö seems to read better as ôand not intendedö

Accepted

Text will be changed to read:

"Time Server û- Intended for the management of fabric-wide expiration timers or elapsed time values and not intended for precise time synchronization"

Comment 72.   [E] Section 3.7.1, page 6, para 3

"...The value of the Domain I/D ranges from 1 to 239 (0xEF)."

Both ôIDö and ôI/Dö are used to mean ôidentifierö within the same paragraph. Common usage suggests ôIDö throughout. Also occurs elsewhere, e.g. page 21

Accepted

Comment 73.   [E] Section 3.7.1, page 17, para 3

For some reason the file contains a number of occurrences of a non-ascii character instead of an apostrophe. Also occurs on pages 64 for example.

Accepted

Comment 74.   [E] Section 3.7.1, page 17, para 4

ôFLOGIö: this is the first occurrence of this FC term; it should be spelled out here or a forward reference could be provided

Accepted

Comment 75.   [E] Section 3.9, page 18. item a)

a) "Fabric Login (FLOGI) -- An operation whereby the N_PORT
   registers its presence on the fabric, obtains fabric
   parameters, such as classes of service supported, and
   receives its N_PORT address,"

Reads better without the comma after ôfabric parametersö.

Accepted

Comment 76.   [E] Section 4, page 18, para 3

"Within the fibre channel device domain, fabric-addressable
entities consist of other N_PORTs and devices internal to the
fabric that perform the fabric services defined in [FC-GS3]."

ôdevicesö is possibly ambiguous here, could say ôFC devicesö or
iFCP devicesö depending on the intent.

Accepted

Text will be changed to:

"Within the fibre channel device domain, fabric-addressable
entities consist of other N_PORTs and fibre channel devices
internal to the fabric that perform the fabric services defined
in [FC-GS3]."

Comment 77.   [E] Section 4.6.1, Page 25, Para 1

"As described in section 4.6, each gateway and fibre channel
switch in a bounded iFCP fabric MUST have a unique domain I/D.
In a gateway region containing fibre channel switch elements,
each element obtains a domain I/D by querying the principal
switch as described in [FC-SW2] -- in this case the iFCP
gateway itself. The gateway in turn MUST obtain domain I/Ds on
demand from the iSNS name server acting as the central address
allocation authority. In effect, the iSNS server assumes the
role of principal switch for the bounded fabric. In that case,
the iSNS database contains:"

The fact that a gateway can act as the FC principal switch is
mentioned in this section and others, but there seems to be no
normative text determining when it must do so. This will be
obvious to a knowledgeable reader, or perhaps is covered in an
ancillary document, but given the care taken elsewhere to
provide normative language for æobviousÆ functionality it seems
to be an oversight

Rejected

Since the paragraph is intended to describe behavior that is
normatively specified elsewhere, the use of "MUST" is
incorrect. The text will be changed to the following:

   "As described in section 4.6, each gateway and fibre channel
   switch in a bounded iFCP fabric has a unique domain I/D. In a
   gateway region containing fibre channel switch elements, each
   element obtains a domain I/D by querying the principal switch
   as described in [FC-SW2] -- in this case the iFCP gateway
   itself. The gateway in turn obtains domain I/Ds on demand from
   the iSNS name server acting as the central address allocation
   authority. In effect, the iSNS server assumes the role of
   principal switch for the bounded fabric. In that case, the iSNS
   database contains..."

Comment 78.   [E] Section 5.2.2.3, page 35, paras 3 and 4

   These two paragraphs use the terms æheartbeatÆ and
   æconnectivity probeÆ as informal synonyms for LTESTs. Use of
   the same synonym in both places would keep the reader from
   wondering whether the two synonyms represent the same concept.

Accepted

Comment 79.   [E] Section 5.2.2.4.3, page 37, para 1

   "Window scaling, as specified in [RFC1323], allows full
   utilization of links with large bandwidth - delay products and
   should be supported by an iFCP implementation."

   Is ôshouldö intended to be normative (capitalized)?

Response

   The lower case usage is intentional. The goal is to reflect a
   desirable bias rather than the sort of mandate defined in
   [RFC2119].

Comment 80.   [E] Section 5.2,3, page 32, items c) and d)

   a) "For an FC frame received from the IP network, a gateway
      detects a CRC error in the encapsulation header. The gateway
      shall abort the session as described in section...."

   b) "The TCP connection associated with the login session fails
      for any reason. The gateway detecting the failed connection
      shall abort the session as described in section...."

   ôshallö should be capitalized.

Accepted

Comment 81.   [E] Section 5.4, page 39, last paragraph

```
"When operating in Address Translation mode, (see section ...)
the iFCP gateway must recalculate the fibre channel CRC."
```

ômustö should be in caps.

Accepted

Comment 82.   [E] Section 5.4, page 41, "TRN" mnemonic

ItÆs unfortunate that ôTRNö can be read as either ôtransparentö
or ôtranslationö and therefore has less mnemonic value.

Accepted

"TRN", the mnemonic for "transparent mode", will be changed to
"TRP".

Comment 83.   [E] Section 6.2, page 49, para 1

"UNBIND is used to release a bound TCP connection and.
optionally, return it to the pool of unbound TCP connections."

Punctuation: ôand. optionally, ö should be ôand optionallyö.

Accepted

Comment 84.   [E] Section 7.3, page 58, para 2

"The formats of each special link service message, including
supplemental data where applicable, are shown in the following
sections."

ôThe formats of eachà message areö is awkward, suggest ôThe
format of eachà message isö.

Accepted

Comment 85.   [E] Section 7.3.1.6, page 63, para 2

"This ELS shall always be sent as an augmented ELS regardless
of the translation mode in effect."

"Shall" should be capitalized.

Accepted

The text must also be modified to replace "augmented" with
"special", as given below.

"This ELS SHALL always be sent as a special ELS regardless of
the translation mode in effect."

[E] Section 7.3.1.14, page 71, last paragraph

"The size of each frame to be sent to the destination N_PORT
MUST NOT exceed the maximum frame size that the destination

N_PORT can accept. The sequence identifier in each frame
header SHALL be copied from the augmented ELS and the sequence
count shall be monotonically increasing."

"Shall" should be capitalized.

Accepted

Comment 86.   [E] Section 10.2.4, page 82, paras 1 and 2

"iFCP is a peer-to-peer protocol. iFCP sessions may be
initiated by either or both peer gateways. Consequently, bi-
directional authentication of peer gateways MUST be provided.

"iFCP gateways MUST use Discovery Domain information obtained
from the iSNS server [ISNS] to determine whether the initiating
fibre channel N_PORT should be allowed access to the target
N_PORT. N_PORT identities used in the Port Login (PLOGI)
process shall be considered authenticated provided the PLOGI
request is received from the remote gateway over a secure,
IPSec-protected connection."

These paragraphs seem to be statements of required
functionality but are too general to use normative language
(ôMUSTö). Later sections contain the normative text necessary
to cover these topics.

Accepted

Comment 87.   [E] Section 10.2.5, page 82, para 1

See Comment 86.

Accepted

Comment 88.   [E] Section 10.2.6, pages 82 and 82, all
paragraphs

See Comment 86.

Accepted

5. Comments from Mallikarjun Chadalapaka

Comment 89.   [E] Section 1.2

"...standards controlled by NCITS T10 and T11."

"NCITS" should be "INCITS".

Accepted

Comment 90.   [E] 2.1 Definitions

    "Gateway Region -- The portion of an iFCP fabric accessed
    through an iFCP gateway. Fibre channel devices in the region
    consist of all fibre channel devices locally attached to the
    gateway."

    The first sentence here when interpreted wrt a Nx_port sitting
    within a given gateway region, implies something that isn't
    right - viz. the rest of the iFCP fabric. The second sentence
    makes the intention clear, if "locally attached" includes the
    entire local fabric. My suggestion would be: "The portion of
    an iFCP fabric that accesses the rest of the fabric through one
    iFCP gateway."

Accepted

    The definition will be changed to the following:

    "Gateway Region -- The portion of an iFCP fabric accessed
    through an iFCP gateway by a remotely attached N_PORT. Fibre
    channel devices in the region consist of all those locally
    attached to the gateway."

Comment 91.   [T] Section 3.3.1, pp 14, para 7

    "Time Server -- Intended for the management of fabric-wide
    expiration timers or elapsed time values and is not intended
    for precise time synchronization."

    I am curious about this - is it the conclusion the iFCP authors
    reached? The reason I ask is that IIRC, FCIP allows using this
    for time sync.

Response

    See Comment 71 for the proposed change to this section.

    The characterization is found in the literature and based on
    the following from the [FC-GS3] specification, section 7, page
    161.

    "The Time Service is provided to serve time information that is
    sufficient for managing expiration time."

Comment 92.   [T] Section 3.7, pp 14, para 2

    "The source and destination N_PORT fabric addresses embedded in
    the S_ID and D_ID fields represent the physical MAC addresses

of originating and receiving N_PORTs."

     I am not sure that it is a correct analogy....S_ID and D_ID are
     actually (potentially transient) addresses assigned by the
     fabric, Port Names are more akin to the MAC addresses.

  Accepted

     See Comment 60.

  Comment 93.   [E] 4. The iFCP Network Model

     "The iFCP protocol enables the implementation of fibre channel
     mixed or switched fabric functionality on an IP network."

     I am not sure what is intended by "fibre channel mixed or
     switched" here, perhaps this could use rewording.

  Accepted

     The text will be changed to:

     "The iFCP protocol enables the implementation of fibre channel
     fabric functionality on an IP network."

  Comment 94.   [E] Section 4, pp 20, para 1

     "Each iFCP gateway contains two standards-compliant fibre
     channel ports and an iFCP Portal for attachment to the IP
     network."

     Why are two FC ports required? As far as I can tell, even one
     E_Port works just as well - is it to be technically called as a
     "switch"?

     Also, is there a reason for limiting to only one IP address
     (implied by one iFCP Portal)? I see that supporting multiple
     iFCP Portals would require enahancements to the data structures
     presented - but can you please comment on any architectural
     issues here?

  Response

     The figure is one example of a supported implementation. It
     was intended to parallel the earlier fibre channel fabric
     example as a way of showing the transition to an equivalent
     iFCP fabric.

     The selected example was chosen because it was easier to depict
     within the constraints of ASCII text. An E_PORT example could
     have also been used. In either case, the device incorporating

iFCP portal functionality would be called an "iFCP gateway".

The considerations to be addressed when connecting multiple
iFCP portals to a gateway region are discussed in Comment 12.

Comment 95.   [E] section 4, pp 20, para 2

   "... channel switch element. At this interface, remote N_PORTs
   are presented as fabric-attached devices. Conversely, on the IP
   network side, the gateway presents each locally connected
   N_PORT as a logical fibre channel device."

   I am not sure the last sentence is correct - I think "logical
   fibre channel device" should probably be replaced by "a TCP
   connection".

Rejected

   The logical fibre channel device represents the layer 4
   abstraction visible on the IP network.

Comment 96.   [E] Section 4.1, pp 20, para 1

   "...cases, the gateway may support any standards-compliant
   fibre channel fabric type by incorporating the functionality
   required to..."

   Can you please comment if really "fabric type" is meant here?
   Or, is it the "fabric port type"?

Response

   More accurately, "fabric type" should be changed to "fibre
   channel network topology." The specification will be changed
   accordingly. See Comment 5.

Comment 97.   [E] Section 4.1, pp 20, para 1

   "...present locally attached N_PORTs as logical iFCP devices."

   It may be useful to define "iFCP device" in section 2.1.

Rejected

   From section 2.1:

   "Logical iFCP Device - The abstraction representing a single
   fibre channel device as it appears on an iFCP network."

   The specification will not be changed.

Comment 98.   [T] Section 4.4.1, pp 22, para 2

   "...messages, a gateway cannot convert such addresses in the

payload of vendor- or user-specific fibre channel frame
traffic."

Not being very familiar with today's FC, can you please comment
if these proprietary versions of frame formats (with even the
D_ID out of place) are legal on regular fabrics? Seems like
the entire fabric should be capable of special handling
these...

Response

There is one and only one acceptable format for FC frames. That
said, the issue is not the frame format but the payload
contents.

Besides the addresses in the FC frame header, an iFCP
implementation is only cognizant of N_PORT addresses that may
be embedded in the payload of standards-compliant link service
messages. It cannot remap such addresses if present in the
payloads of user-specified or vendor-specific frames.

No change to the specification will be made.

Comment 99.   [T] Section 4.4.3, pp 22, para 1

"In an unbounded iFCP fabric, limiting the scope of an N_PORT
address to a gateway region reduces the likelihood that
reassignment of domain I/Ds caused by a disruption in one
gateway region will cascade to others."

"In an unbounded iFCP fabric, limiting the scope of an N_PORT
address to a gateway region reduces the likelihood that "

Does it not prevent the likelihood?

Accepted

The text will be changed to:

"In an unbounded iFCP fabric, limiting the scope of an N_PORT
address to a gateway region prevents reassignment of domain
I/Ds caused when a disruption in one gateway region cascades to
others."

Comment 100.   [T] Section 4.4.3, pp 22, para 2

"In addition, a bounded iFCP fabric has an increased dependency
on..."

Suggest changing "In addition" to "On the other hand".

Accepted

Comment 101.   [E] Section 4.4.3, pp 22, para 3

"Finally, adding a gateway to a bounded fabric is more likely
to disrupt the operation of all devices in the gateway region
along with those already in the fabric as new, fabric-wide
N_PORT addresses are assigned."

Isn't the issue in this para the same as that in the first
para, albeit from the bounded fabric's perspective? If so,
suggest merging them.

Rejected

Adding a new gateway region is distinct from disrupting an
existing region and therefore merits its own mention.

Comment 102.   [E] Section 4.4.3, pp 23, para 4

...be done non-disruptively and requires only that new
gateway's iSNS..."

Change "that" to "that the".

Accepted

Comment 103.   [T] Section 4.5, The iFCP N_PORT Address Model

b) "A 24-bit N_PORT alias. A fibre channel N_PORT address
   assigned by a gateway operating in address translation mode
   to identify a remotely attached N_PORT. Frame traffic is
   directed to a remotely attached N_PORT by means of the
   N_PORT alias."

At any point in time, there can only be 2^24 N_PORTs
communicating even in the address translation mode, even though
this mode allows the same N_PORT to be mapped to different
nports in different gateway regions at different times. If
this is a correct interpretation, I suggest that this be made
clear in section 4.4.2, which currently simply states that
there are no architectural limitations on the number of fibre
channel devices in this mode.

Accepted in Part

While the addressability in a given gateway region is
constrained by the fibre channel address model, the aggregate
addressability of all gateway regions comprising an unbounded
iFCP fabric can exceed that limit.

To make this clearer, the text will be changed as follows:

b) "Since N_PORT fibre channel addresses in an unbounded iFCP
      fabric are not fabric-wide, the number of iFCP gateways,
      fibre channel devices and switch elements that may be
      internetworked may exceed the fibre channel fabric limits."

Comment 104.   [E] Section 4.6.1, pp 25, para 4

   "In its role as principal switch within the gateway region, an
   iFCP..."

   General comment - Change to "...as the Principal Switch...".

Rejected

Comment 105.   [T] Section 5.2.1, pp 30, para 4

   "...A gateway implementation MAY establish a pool of unbound
   connections to reduce the session setup time. Such pre-
   existing TCP connections between iFCP Portals remain unbound
   and uncommitted until allocated to an iFCP session through a
   CBIND message"

   I wonder if there is a scope for DoS attack here with the
   possibility of one gateway potentially holding onto several
   unused TCP connections infinitely...."

Response

   No. However, the specification will be modified to point out
   that a gateway may recover resources at any time by simply
   closing unbound connections. See Comment 21.

Comment 106.   [E] Section 5.2.2.1, pp31, para 6

   "If a descriptor does not exist, one SHALL be created in
   response to an iSNS name server query."

   Did you mean "SHALL be created after the response to an iSNS
   name server query is received"?

Response

   The test will be changed to:

   "If a descriptor does not exist, one SHALL be created using the
   information returned by an iSNS name server query."

Comment 107.   [E] Section 5.2.2.1.1, pp 31, para 1

   "A Remote N_PORT descriptor SHALL only be updated as the result
   of an iSNS query that returns information for the specified
   worldwide port name. Following such an update, a new N_PORT
   alias SHALL NOT be assigned."

I assume you meant "iSNS response" instead of "iSNS query"?

I am a little confused by the SHALL NOT. Here's what I was
assuming as the sequence of events

     1. Local FC Name Server query.

     2. iFCP gateway picks it up.

     3. Consults with iSNS server

     4. iSNS provides the remote N_PORT for the WWN

     5. iFCP gateway assigns a local alias if in translation mode
        and if the remote N_PORT ID clashes with a pre-existing
        local NPORT_ID.

     I do not see why this sequence should be prohibited. Comments
     will certainly help.

Accepted in Part

     The text will be modified as described in Comment 108.

     The 24-bit N_PORT component of the remote N_PORTs address and
     its local alias can never clash. The gateway transparently
     converts the alias to a network address, consisting of the TCP
     connection I/D, TCP Port number and the N_PORT ID assigned by
     the remote gateway.

Comment 108.   [T] [Section 5.2.2.1.1](), pp 31, para 1

     "A Remote N_PORT descriptor SHALL only be updated as the result
     of an iSNS query that returns information for the specified
     worldwide port name. Following such an update, a new N_PORT
     alias SHALL NOT be assigned.

     "Until such an update occurs, the contents of a descriptor may
     become stale as the result of any event that invalidates or
     triggers a change in the N_PORT network address of the remote
     device, such as a fabric reconfiguration or the device's
     removal or replacement."

     I assume that generally what is meant by "Until such an update
     occurs" is "In the absence of an operational iFCP session based
     on a descriptor". If so, it perhaps requires rewording.

Accepted in Part

     Descriptors are only built and updated as a consequence of name
     server requests or state change notifications. An iFCP session
     may not necessarily be associated with these activities.

     The text will be reworded as shown below to add the state

change case and clarify the order of events leading to a stale
descriptor.

"A Remote N_PORT descriptor SHALL only be updated as the result
of an iSNS query to obtain information for the specified
worldwide port name or from information returned by an iSNS
state change notification. Following such an update, a new
N_PORT alias SHALL NOT be assigned.

"Before such an update, the contents of a descriptor may have
become stale as the result of any event that invalidates or
triggers a change in the N_PORT network address of the remote
device, such as a fabric reconfiguration or the device's
removal or replacement."

Comment 109.   [E] Section 5.2.2.1.1, pp 31, para 4

"Once the originating N_PORT learns of the reconfiguration,
usually through the name server state change notification
mechanism, the name server lookup needed to reestablish the
iFCP session will automatically purge such stale data from the
gateway."

Just a clarification here - it seems to me that the SCN for a
remote N_PORT ID needs to delivered via the iFCP gateway
anyway, so why not purge the stale mapping then (instead of
waiting for the new SNS query from the local N_PORT?

Accepted

The text will be changed to:

"Once the originating N_PORT learns of the reconfiguration,
usually through the name server state change notification
mechanism, information returned in the notification or the
subsequent name server lookup needed to reestablish the iFCP
session will automatically purge such stale data from the
gateway."

Comment 110.   [T] Section 5.2.2.2, pp 33

f) "A CBIND response with a CBIND STATUS of "N_PORT session
   already exists" indicates that the remote gateway has
   concurrently..."

I think the document should specify that this status be mapped
to the LS_RJT reason code of "Login/command already in
progress" - 0x0E. Also, there may be N_PORTs that go down
without issuing a LOGO, and attempt a PLOGI once they come back
- unbeknownst to the iFCP gateway still with the old session
descriptor. It isn't clear to me how this is proposed to be
dealt with.

Rejected

See Comment 15. The specified behavior is meant to serve as a tie-breaking mechanism. Once the session is established, the PLOGI response will be generated by the receiving N_PORT in accordance with the semantics defined in [FC-FS].

A PLOGI after an iFCP session exists is handled in accordance with section 7.3.1.7, paragraph 5, which states:

"As specified in section 5.2.2.2, a PLOGI request addressed to a remotely attached N_PORT MUST cause the creation of an iFCP session if one does not exist. Otherwise, the PLOGI and PLOGI ACC payloads MUST be passed transparently to the destination N_PORT using the existing iFCP session."

Section 5.2.2.2 will be modified to include the case of a PLOGI issued when an iFCP session exists.

Comment 111.   [T] Section 5.2.2.3, pp 35

b) "An LTEST message is not received within twice the specified interval or the iFCP session has been quiescent for longer than twice the specified interval."

I think "or" above should be "and" - else it implies that the LTEST message must be received periodically even in the presence of other traffic.

Rejected

See Comment 18.

If liveness testing was requested for an iFCP session, an LTEST message must be received within twice the specified interval regardless of whether or not other traffic is present.

Comment 112.   [T] Section 5.2.3, pp 37

a) "An LS_RJT response is returned to the gateway that issued the PLOGI ELS. The gateway SHALL forward the LS_RJT to the local N_PORT and complete the session as described in..."

My reading is that the gateway does not "issue" the PLOGI ELS, it merely facilitates the transport of an issued PLOGI ELS. The wording here is a little confusing - I also believe that the forwarding should be to the remote N_PORT, not local.

[Also,] I recommend "terminate"/"close" in all the places "complete" is used.

Accepted

The text will be modified as follows:

a) "An LS_RJT response is returned to the gateway from which
   the PLOGI ELS originated. That gateway SHALL forward the
   LS_RJT to the locally attached N_PORT and terminate the
   session as described in..."

Comment 113.   [E] Section 5.2.3.1, pp 37, para 2

"Unbind session control ELS as described in section 6.2."

I am a little confused about the status of Unbind here - is it
a FC-FS approved ELS or an iFCP session control message?

Response

Since Unbind is an iFCP session control message, the text will
be changed to:

"Unbind session control message as described in section 6.2."

Comment 114.   [T] Section 5.2.3.2, pp 38, para 4

"In any event, the TCP connection SHOULD be terminated with a
connection reset (RST). If the local N_PORT has logged in to
the remote N_PORT, the gateway SHALL send a LOGO to the local
N_PORT."

I think the draft should specify both OPEN and OPEN PENDING
cases here. For OPEN state, a local LOGO is required as
stated, whereas for OPEN PENDING, a local LS_RJT may be
appropriate.

Also, it is useful to state that the proxied ELS (in either
case) be indistinguishable from the end-to-end ELS in its
payload (so any sanity checking done by endnode software would
continue to work).

Accepted

Comment 115.   [T] Section 5.4.1, pp 40

"Protocol# IANA-assigned protocol number identifying the
protocol using the encapsulation. For iFCP the value is
(/TBD/)."

Should FCEncap document be referred here instead?

Accepted

See Comment 23.

Comment 116.   [E] Section 5.4.3, pp 43, para 2

"Following frame validation, the S_ID and D_ID fields in the
frame header SHALL be referenced to lookup the iFCP session
descriptor (see section 5.2.2.2). If no iFCP session descriptor
exists, the frame SHALL be discarded."

With the exception of PLOGI?

Accepted

The specification will be modified to address the case where a
frame triggers the creation of an iFCP session.

Comment 117.   [E] Section 5.4.3, pp 43, para 3

"Frames types submitted for encapsulation and forwarding on the
IP..."

"Frames" should be "Frame".

Accepted

Comment 118.   [E] Section 6, pp 44, para 1

"TCP session control messages are used to create and manage an
iFCP session as described in section 5.2.2. They are passed
between peer iFCP Portals and are only processed within the
iFCP layer.

"The message format is based on the fibre channel extended link
service message template shown below...."

It may be useful to state that this message forms the "FC
Frame" payload. of the iFCP frame. It may also be useful to
state the value of LS_COMMAND in the encap header (0?).

Instead of having two LS_COMMAND fields - one in the header and
one in the payload - for these messages, a simpler approach
could be to state that LS_COMMAND in the header contains an
iFCP-defined value when SES=1 (and remove the one in the
payload).

Accepted in Part

In accordance with Comment 26, the mnemonic for the LS_COMMAND
field in the encapsulation header will be changed to eliminate
confusion as follows:

From section 5.4, Encapsulation of Fibre Channel Frames:

    "LS_COMMAND_ACC   For a special link service ACC
                      response to be processed by iFCP, the
                      LS_COMMAND_ACC field SHALL contain
                      bits 31 through 24 of the LS_COMMAND
                      to which the ACC applies. Otherwise
                      this field shall be set to zero."

   From section 6, TCP Session Control Messages:

    LS_COMMAND_ACC   0

   With the addition of the new mnemonic, the above text clearly
   specifies how the field is to be set.

Comment 119.   [E] Section 6.1, pp 46, para 2

   "The following shows the format of the CBIND request."

   I take it that this CBIND structure goes into the Session
   Control Message starting from word 6? Same question on CBIND
   response.

Rejected

   That is correct. The existing text seems to explain this
   adequately.

Comment 120.   [T] Section 6.2, pp 49, para 1

   "UNBIND is used to release a bound TCP connection and.
   optionally, return it to the pool of unbound TCP connections."

   I assume "release" here implies - "remove the binding"?

   Is there a way to convey the preference to not terminate the
   connection on the part of the sender? IOW, where is the
   optionality selected?

Response

   See Comment 21.

Comment 121.   [E] Section 6.2, pp 50, para 1

   "transmitted in the connection that is to be unbound. The
   time..."

Change "in" to "on".

Accepted

Comment 122.   [T] Section 8.2.1, pp 76, para 1

   "The R_A_TOV limit on frame lifetimes SHALL be enforced by
   means of the time stamp in the encapsulation header (see
   section 5.4.1) as described in this section."

   A couple of general questions on this section -

   a) Is Unsynchronized operation allowed? If so, how is the
      R_A_TOV expectation met?

   b) If an incorrect configuration causes the timestamp of the
      incoming frame to be higher than the gateway's time base, it
      is better if there is a way to detect and perhaps resync
      both ends with the same SNTP server (as opposed to one out
      of a list returned by iSNS). As far as I can tell, the
      current text specifies that it would simply cause the frames
      to be discarded, but doesn't break the binding nor terminate
      the TCP connection - perhaps relying on the end nodes to
      LOGOUT?

Accepted in Part

   For item a), see the response to Comment 35.

   For item b), iFCP specifies the following behavior:

   d) "If the incoming frame has a non-zero time stamp, the
      receiving gateway SHALL compute the absolute value of the
      time in flight and SHALL compare it against the value of
      IP_TOV specified for the IP fabric.

   e) "If the result in step (d) exceeds IP_TOV, the encapsulated
      frame shall be discarded. Otherwise, the frame shall be
      de-encapsulated as described in section ...."

   Since it is impossible to guarantee that one time reference
   won't be skewed negatively with respect to the other. the
   propagation delay test is against the absolute value of the
   time difference.

   The iFCP spec will be modified to state that an iFCP gateway
   implementation MAY terminate an iFCP session if the rate at
   which stale frames are detected exceeds some administratively-
   specified threshold.

6. Security Considerations

The applicable security provisions are defined in [IFCP].

7. References

[RFC2026] Bradner, S., "The Internet Standards Process -- Revision
         3", BCP 9, RFC 2026, October 1996.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate
         Requirement Levels", BCP 14, RFC 2119, March 1997

[IFCP] Monia, C., et al, ö iFCP - A Protocol for Internet Fibre
         Channel Storage Networking", draft-ietf-ips-ifcp-10.txt,
         February 2002

[FC-FS] dpANS INCITS.XXX-200X, "Fibre Channel Framing and Signaling
         Interface", Revision 1.7, NCITS Project 1331-D, February
         2002

[SECIPS] Aboba, B., et-al., "Securing Block Storage Protocols Over
         IP", revision 11, February 2002

[FC-GS3] dpANS X3.XXX-200X, "Fibre Channel Generic Services -3 (FC-
         GS3)", revision 7.01, NCITS Project 1356-D, November 2000

8. Author's Addresses

Charles Monia   Franco Travostino
Josh Tseng   Director, Content
                               Internetworking Lab,
Nishan Systems   Nortel Networks
3850 North First Street   3 Federal Street
San Jose, CA 95134   Billerica, MA 01821
Phone: 408-519-3986   Phone: 978-288-7708
Email: Email:
cmonia@nishansystems.com   travos@nortelnetworks.com

copyrights defined in the Internet Standards process must be
followed, or as required to translate it into languages other than
English.