                Deprecation of the Internet Fibre Channel Protocol (iFCP)
                        Address Translation Mode

Abstract

   Changes to Fibre Channel have caused the specification of the
   Internet Fibre Channel Protocol (iFCP) address translation mode to
   become incorrect. Due to the absence of usage of iFCP address
   translation mode, it is deprecated by this document. iFCP address
   transparent mode remains correctly specified.

   iFCP address transparent mode has been implemented and is in current
   use; therefore, it is not affected by this document.

   This document also records the state of Protocol Number 133, which
   was allocated for a pre-standard version of the Fibre Channel
   Internet Protocol (FCIP).

Status of This Memo

   This is an Internet Standards Track document.

   This document is a product of the Internet Engineering Task Force
   (IETF). It represents the consensus of the IETF community. It has
   received public review and has been approved for publication by the
   Internet Engineering Steering Group (IESG). Further information on
   Internet Standards is available in Section 2 of RFC 5741.

   Information about the current status of this document, any errata,
   and how to provide feedback on it may be obtained at
   http://www.rfc-editor.org/info/rfc6172.

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1. Introduction

    See Section 3 of [RFC4172] for introductory material on Fibre Channel
    concepts.

    The Internet Fibre Channel Protocol (iFCP) [RFC4172] operates in two
    modes with respect to Fibre Channel N_PORT fabric addresses (24-bit
    N_PORT_IDs): address transparent mode and address translation mode
    (both modes are specified in [RFC4172]):

    o Address transparent mode is a pass-through mode that preserves
       Fibre Channel N_PORT fabric addresses.

    o Address translation mode is a Fibre Channel analog to Network
       Address Translation (NAT) in which iFCP gateways change Fibre
       Channel N_PORT fabric addresses at the boundary between Fibre
       Channel and the Internet. Both the source (S_ID) and destination
       (D_ID) N_PORT fabric addresses may be changed by the iFCP
       gateways.

    This document deprecates iFCP address translation mode because the
    specification has not tracked changes in Fibre Channel and because
    there are no known implementations.

    Protocol Number 133 was allocated for a pre-standard version of the
    Fibre Channel Internet Protocol (FCIP) that encapsulated FC frames
    directly in IP packets. That protocol number is not used by the
    standard FCIP protocol [RFC3821] [FC-BB-3], but implementations of
    the pre-standard protocol were deployed. Therefore, this document
    makes no change to the current allocation of Protocol Number 133.

2. 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].

3. iFCP Address Translation Mode

    iFCP address translation mode has to translate addresses embedded in
    transmitted data. This is analogous to NAT translation of IP
    addresses embedded in IP packets. Fibre Channel restricts the
    occurrence of embedded fabric addresses to control messages (frames);
    N_PORTs send and receive two types of control frames that may contain
    embedded fabric addresses:

o Extended Link Services (ELSs); and

o FC-4 Link Services (FC-4 LSs) for the Small Computer System
   Interface (SCSI) over Fibre Channel Protocol (FCP).

The embedded fabric address translations for N_PORT control frames
are specified in Section 7.3 of [RFC4172]. These translations were
correct as specified for Fibre Channel as of approximately 2003,
based on the [FC-FS] standard for ELSs and the [FCP] standard for FCP
FC-4 LSs.

3.1. Problem Discussion

Significant changes have been made to FC control frames since the
iFCP specification [RFC4172] was published; the currently applicable
FC standards are [FC-LS] and [FCP-3], and additional changes are
forthcoming in the [FC-LS-2] and [FCP-4] standards projects, which
are nearing completion. These changes have caused Section 7.3 of
[RFC4172] to become incorrect.

Actual iFCP deployment has diverged significantly from that
anticipated during the development of [RFC4172]. All deployments of
iFCP known to the authors of this document use iFCP address
transparent mode and are used only for FC inter-switch links. iFCP
address translation mode as specified in [RFC4172] cannot be used for
FC inter-switch links because the necessary embedded fabric address
translations for FC inter-switch control messages (Switch Fabric
Internal Link Services (ILSs)) have not been specified.

3.2. iFCP Address Translation Mode Deprecation

For the reasons described above, it is prudent to deprecate iFCP
address translation mode in preference to updating it to the current
state of Fibre Channel standards. Updating iFCP address translation
mode would create a continuing requirement to update an unused
protocol mode to match future changes to FC control frames.

Therefore, this document deprecates iFCP address translation mode:

o iFCP address translation mode [RFC4172] SHOULD NOT be implemented
   and SHOULD NOT be used.

o The status of [RFC4172] remains Proposed Standard RFC in order to
   retain the specification of iFCP address transparent mode.

o The [RFC4172] specification of iFCP address translation mode
   should be treated as Historic [RFC2026].

4. FCIP and Protocol Number 133

   Protocol Number 133 was allocated for Fibre Channel (FC) [IANA-IP]
   and used by a pre-standard version of the FCIP protocol that
   encapsulates FC frames directly in IP packets. The standard FCIP
   protocol [RFC3821] [FC-BB-3] encapsulates FC frames in TCP and hence
   does not use Protocol Number 133, but implementations of the pre-
   standard version of the FCIP protocol were deployed [MR]. Based on
   this deployment, the protocol number needs to remain allocated.

5. Security Considerations

   The security considerations for iFCP continue to apply; see Section
   10 of [RFC4172].

6. IANA Considerations

   IANA has added this document as a supplemental reference for the
   allocation of Protocol Number 133 but hasn't changed that allocation.

7. Conclusions

   For the reasons described in this document, iFCP Address Translation
   mode is deprecated, and the allocation of Protocol Number 133 remains
   unchanged at this time.

8. References

8.1. Normative References

   [FC-FS]   Fibre Channel Framing and Signaling Interface (FC-FS), ANSI
              INCITS 373-2003, October 2003.

   [FC-LS]   Fibre Channel - Link Services (FC-LS), ANSI INCITS
              433-2007, July 2007.

   [FCP]   Fibre Channel Protocol (FCP), ANSI INCITS 269-1996, April
              1996.

   [FCP-3]   Fibre Channel Protocol - 3 (FCP-3), ISO/IEC 14776-223:2008,
              June 2008.

   [IANA-IP] Assigned Internet Protocol Numbers, IANA Registry,
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   [RFC2026] Bradner, S., "The Internet Standards Process -- Revision
              3", BCP 9, RFC 2026, October 1996.

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              Requirement Levels", BCP 14, RFC 2119, March 1997.

   [RFC4172] Monia, C., Mullendore, R., Travostino, F., Jeong, W., and
              M. Edwards, "iFCP - A Protocol for Internet Fibre Channel
              Storage Networking", RFC 4172, September 2005.

8.2. Informative References

   [FC-BB-3] Fibre Channel Backbone - 3 (FC-BB-3), ANSI INCITS 414-2006,
              July 2006.

   [FC-LS-2] Fibre Channel - Link Services - 2 (FC-LS-2), INCITS Project
              2103-D, Technical Committee T11 (www.t11.org).

   [FCP-4]   Fibre Channel Protocol - 4 (FCP-4), INCITS Project 1828-D,
              Technical Committee T10 (www.t10.org).

   [MR]   Rajagopal, M., Private email communication, June 2009.

   [RFC3821] Rajagopal, M., Rodriguez, E., and R. Weber, "Fibre Channel
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