Internet Engineering Task Force (IETF)
Request for Comments: 6172
Updates: 4172
Category: Standards Track
ISSN: 2070-1721

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March 2011

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]):

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

- Extended Link Services (ELSs); and

- 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:

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

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

- 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, http://www.iana.org, visited October 2010.

[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.

[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 Over TCP/IP (FCIP)", RFC 3821, July 2004.

9. Acknowledgments

The authors would like to thank Tom Talpey, David Harrington, Joe Touch, Paul Hoffman, and Pekka Savola for helpful comments on this document.

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