INTERNATIONAL STANDARD

ISO/IEC 14165-222

First edition
2005-05

Information technology –
Fibre channel –

Part 222:
Single-byte command sets-2 mapping protocol (FC-SB-2)

PRICE CODE XC

For price, see current catalogue

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INFORMATION TECHNOLOGY – FIBRE CHANNEL –

PART 222: Single-byte command sets-2 mapping protocol (FC-SB-2)

FOREWORD

1) ISO (International Organization for Standardization) and IEC (International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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International Standard ISO/IEC 14165-222 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

Introduction

FC-SB-2 describes the Fibre Channel protocol mapping for the Single-Byte Command Code Sets. The protocol is intended for use with ANSI X3.230, FC-PH, and its subsequent enhancements which specify the Fibre Channel Physical and Signalling Interface. FC-SB-2 is one of a number of Fibre Channel protocol mappings, referred to as FC-4s.

The reader should be familiar with FC-PH, Single-Byte Command Code Sets Connection (SBCON) Architecture (ANSI X3.296-1997).

Figure 1 shows the relationship of this FC-4 proposed working draft standard (highlighted rectangle) with other Fibre Channel standards and draft proposed standards.

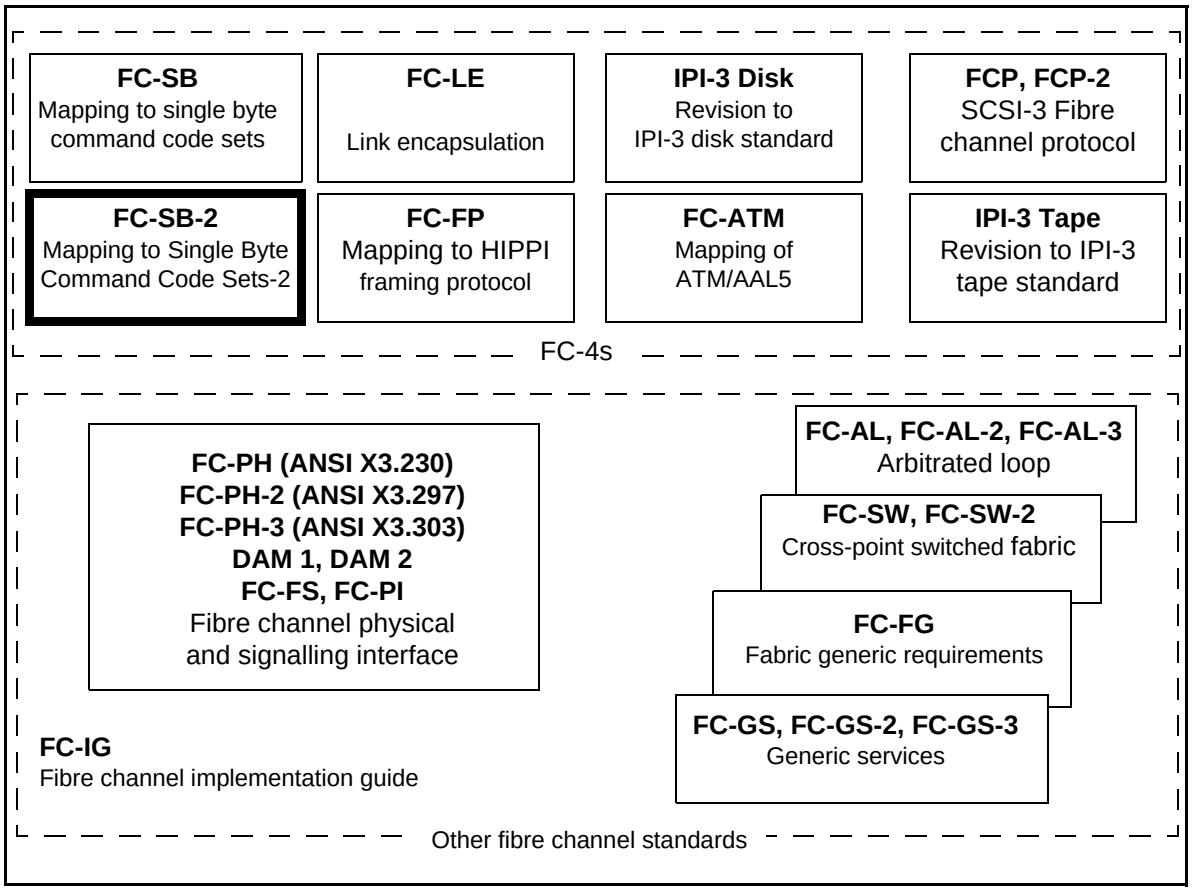

Figure 1 – Document relationship

The information presented in this document is grouped into clauses:

Clause 1, “Scope,” gives a general introduction to the document.

Clause 2, “Normative references,” lists the standards which are referenced in the text and which constitute provisions of this document.

Clause 3, “Definitions and conventions,” describes the basic elements, acronyms, naming conventions, and terminology used in this document.

Clause 4, “Structure and concepts,” provides an overview of the structure, concepts, configurations, and mechanisms used in this document and FC-PH, reference [1].

Clause 5, “FC-PH Link Control,” describes how FC-2 link services, in conjunction with the link header, are used to perform SB-2 link-level and device-level functions.

Clause 6, “Link-Level functions,” describes the link-level services and link-control functions required to establish and maintain the operational state of the FC-link.

Clause 7, “N_Port link initialization,” describes an initialization process, in terms of the hierarchical steps (procedures), that need to be performed over the FC-link in order to establish link-level and device-level communication.

Clause 8, “SB-2 Information units,” describes the SB-2 Information Unit (IU) types, and accompanying formats, that are transferred between conformant SB-2 ULPs.

Clause 9, “Device-Level functions and protocols,” describes the functions and protocols to be used in the execution of I/O operations, exchange of control information, and device-level recovery.

Clause 10, “Link error detection,” describes SB-2 level error detection mechanisms that are used in conjunction with FC-PH level error detection to insure the integrity of the FC-link and the data transferred.

Clause 11, “Error recovery actions,” describes the SB-2 link-level and device-level recovery actions taken for FC-PH and SB-2 errors.

Annex A, “Fabric address assignment,” describes a fabric address-assignment scheme which allows a channel to construct the three-byte N_Port ID of a given control unit from a configuration record which contains only a single byte entry for each control unit.

Annex B, “Correlation of exchanges of an exchange pair,” describes some of the facilities available for correlation of an outbound and inbound exchange of an exchange pair.

Annex C, “LRC calculation,” provides the procedure and an example of the Longitudinal Redundancy Check (LRC) calculation.

Annex D, “Status/chaining summary,” summarizes the conditions controlling whether the control unit breaks or continues command chaining and when to present status to the channel.

INFORMATION TECHNOLOGY – FIBRE CHANNEL –

PART 222: Single-byte command sets-2 mapping protocol (FC-SB-2)

1 Scope

This part of ISO/IEC 14165 describes a communication interface between a channel and I/O control units that utilize the Single-Byte Command Code Sets (SBCCS) as implemented in a wide range of data processing systems. It employs information formats and signalling protocols that provide a uniform means for communicating with various types of I/O control units, facilitating a high bandwidth, high performance and long distance information exchange environment. The signaling protocols and information exchanges are defined at a layer (FC-4) to compatibly utilize the link services and other functions provided by the ANSI Fibre Channel Physical and Signaling Interface (FC-PH) architecture (ANSI X3.230-1994, reference [1]). This FC-4 Upper Level Protocol is referred to as the Fibre Channel-Single-Byte-2 Command Code Sets Mapping Protocol (or for brevity, SB-2).

2 Normative references

2.1 General information concerning references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Copies of the following documents may be obtained from ANSI: Approved ANSI standards, approved and draft international and regional standards (ISO, CEN/CENELEC) and approved foreign standards (including BSI, JIS and DIN).

2.2 Approved references

[1] ANSI X3.230-1994, *Information Technology – Fibre Channel Physical and Signaling Interface (FC-PH)*, with amendment 1, AM1-1996.

[2] ANSI X3.297-1997, *Information Technology – Fibre Channel – Physical and Signalling Interface-2 (FC-PH-2)*

[3] ANSI X3.303-1998, *Fibre Channel – Physical and Signalling Interface-3 (FC-PH-3)*

[4] ISO/IEC 14165-131:2000, *Information technology – Fibre Channel – Part 131: Switch Fabric Requirements (FC-SW)*

[5] ANSI X3.296-1997, *Single-Byte Command Code Sets Connection Architecture (SBCON)*

[6] ISO/IEC 9314-2:1989, *Information processing systems – Fibre Distributed Data Interface - Part 2: Token Ring – Media Access Control (FDDI-MAC)*

2.3 References under development

When drafting this document, the following referenced standards were still under development. For information on the current status of the document, or regarding availability, contact the relevant standards body or other organizations, as indicated.

NOTE For more information on the current status of a document, contact the Secretariats of the relevant organisations.

[7] ANSI INCITS-230-1994/AM2-1999, *Fibre Channel-Physical and Signaling Interface (FC-PH) Amendment 2*

[8] ISO/IEC 14165-251, *Information technology – Fibre Channel – Part 251: Framing and Signaling (FC-FS)*