

**INTERNATIONAL  
STANDARD**

**ISO/IEC  
14165-241**

First edition  
2005-05

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**Information technology –  
Fibre channel –**

**Part 241:  
Backbone 2 (FC-BB-2)**



Reference number  
ISO/IEC 14165-241:2005(E)



# INTERNATIONAL STANDARD

# ISO/IEC 14165-241

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## Information technology – Fibre channel –

### Part 241: Backbone 2 (FC-BB-2)

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## Contents

FOREWORD .....	10
INTRODUCTION .....	11
<b>1 Scope .....</b>	<b>13</b>
<b>2 Normative references .....</b>	<b>13</b>
2.1 Approved references .....	13
2.2 Other references .....	13
<b>3 Definitions and Conventions .....</b>	<b>14</b>
3.1 Common Definitions .....	14
3.2 FC-BB-2_ATM Definitions .....	15
3.3 FC-BB-2_SONET Definitions .....	17
3.4 FCIP and TCP/IP Definitions .....	18
3.5 Symbols and abbreviations .....	20
3.5.1 General .....	20
3.5.2 FC-BB-2_ATM .....	20
3.5.3 FC-BB-2_SONET .....	21
3.5.4 FC-BB-2_IP .....	21
3.6 Keywords .....	21
3.6.1 expected .....	21
3.6.2 invalid .....	21
3.6.3 mandatory .....	22
3.6.4 may .....	22
3.6.5 may not .....	22
3.6.6 obsolete .....	22
3.6.7 optional .....	22
3.6.8 reserved .....	22
3.6.9 shall .....	22
3.6.10 should .....	22
3.7 Conventions .....	22
3.8 Notations for Procedure and Functions .....	23
<b>4 FC-BB-2 Structure and Concepts .....</b>	<b>24</b>
4.1 FC-BB-2 Backbone Mappings .....	24
4.2 FC-BB-2 Reference Models .....	24
4.3 FC-BB-2 Specifications Overview .....	25
4.3.1 FC-BB-2_ATM .....	25
4.3.2 FC-BB-2_SONET .....	26
4.3.3 FC-BB-2_IP .....	26
4.4 FC-BB-2 Requirements .....	26
4.4.1 Fibre Channel Class support .....	26
4.4.2 Payload transparency .....	27
4.4.3 Latency delay and timeout value .....	27
4.4.4 QoS and bandwidth .....	27
4.4.5 In-order delivery .....	27
4.4.6 Flow control .....	27
4.5 FC-BB-2 Link Service Codes .....	28
<b>5 FC-BB-2_ATM and FC-BB-2_SONET messages and formats .....</b>	<b>29</b>
5.1 Applicability .....	29

5.2	Message Formats	29
5.2.1	LLC/SNAP Header format	29
5.2.2	BBW_Header format	30
5.2.3	BBW message payload format for SFC	31
5.2.4	BBW message payload format for SR	31
5.2.4.1	SR_Header Formats	31
5.2.4.2	SR_BBW messages	33
5.2.4.3	Format Field Parameters	34
5.2.4.4	SR Commands and Responses	34
5.2.4.5	Exception condition reporting and recovery	37
<b>6</b>	<b>The SR and SFC Protocol Procedures</b>	<b>41</b>
6.1	Applicability	41
6.2	SR Protocol Overview	41
6.3	Description of the SR procedure	42
6.3.1	SR mode of operation	42
6.3.2	SR procedure for addressing	42
6.3.3	SR procedure for the use of the P/F bit	42
6.3.4	SR procedure for data link set-up and disconnection	42
6.3.4.1	Data link set-up	42
6.3.4.2	Information transfer phase	43
6.3.4.3	Data link disconnection	43
6.3.4.4	Disconnected Phase	44
6.3.4.5	Collision of unnumbered commands	44
6.3.4.6	Collision of SR_DM response with SR_SM or SR_DISC command	45
6.3.4.7	Collision of SR_DM responses	45
6.3.5	Procedures for information transfer using multi-selective reject	45
6.3.5.1	Procedures for SR_I messages	45
6.3.5.2	Sending new SR_I messages	45
6.3.5.3	Receiving an in-sequence SR_I message	45
6.3.5.4	Reception of invalid messages	46
6.3.5.5	Reception of out-of-sequence SR_I messages	46
6.3.5.6	Receiving acknowledgement	47
6.3.5.7	Receiving a SR_SREJ response message	47
6.3.5.8	Receiving a SR_RNR message	48
6.3.5.9	BBW busy condition	48
6.3.5.10	Awaiting acknowledgement	49
6.3.5.11	Receiving a SR_RR response messages with the F bit set to 1	49
6.3.5.12	Responding to command messages with the P bit set to 1	50
6.3.6	SR conditions for data link resetting or data link re-initialization (data link set-up)	50
6.3.6.1	Condition 1	50
6.3.6.2	Condition 2	50
6.3.6.3	Condition 3	50
6.3.6.4	Condition 4	50
6.3.7	SR procedure for data link resetting	50
6.3.7.1	Procedure 1	50
6.3.7.2	Procedure 2	51
6.3.7.3	Procedure 3	51
6.3.8	List of SR system parameters	52
6.3.8.1	Timer T1	52
6.3.8.2	Parameter T2	52
6.3.8.3	Maximum number of attempts to complete a transmission N2	52
6.3.8.4	Maximum number of outstanding SR_I messages k	52

6.4	Simple Flow Control (SFC)	53
<b>7</b>	<b>FC-BB-2_ATM Structure and Concepts</b>	<b>54</b>
7.1	Applicability	54
7.2	FC-BB-2_ATM Overview	54
7.3	FC-BB-2_ATM Functional Model	55
7.3.1	B_Port Network Interface	55
7.3.2	ATM Network Interface	55
7.3.3	Mapping and Encapsulation	55
7.3.4	FC-BB-2_ATM Forwarding	56
7.3.5	Call Handling and ATM Service	56
7.3.6	Frame Handling	57
<b>8</b>	<b>Mapping and Message Encapsulation using AAL5</b>	<b>58</b>
8.1	Applicability	58
8.2	Overview	58
8.3	Mapping BBW messages to AAL5	58
<b>9</b>	<b>FC-BB-2_ATM Service Considerations</b>	<b>61</b>
9.1	Applicability	61
9.2	ATM Service Type	61
9.3	Latency Delay and Timeout Value	61
9.4	Bandwidth Sharing and Allocation	61
9.5	Quality of Service (QoS)	62
9.6	Delivery Order	62
9.7	Loss and Flow Control	63
<b>10</b>	<b>FC-BB-2_SONET Structure and Concepts</b>	<b>64</b>
10.1	Applicability and Related Clauses	64
10.2	FC-BB-2_SONET Overview	64
10.3	FC-BB-2_SONET Functional Model	65
10.3.1	Fibre Channel Network Interface	65
10.3.2	SONET Network Interface	66
10.3.3	Mapping and Encapsulation	67
10.3.4	FC-BB-2_SONET Forwarding	67
10.3.5	Call Handling	67
10.3.6	Frame Handling	67
<b>11</b>	<b>Mapping and Message Encapsulation using HDLC-like Framing</b>	<b>68</b>
11.1	Applicability	68
11.2	Overview	68
11.3	Mapping of BBW messages to HDLC format	68
11.4	Mapping HDLC frames to SONET/SDH	70
<b>12</b>	<b>FC-BB-2_SONET Service Considerations</b>	<b>74</b>
12.1	Applicability	74
12.2	Latency Delay and Timeout Value	74
12.3	Delivery Order	74
12.4	Loss and Flow Control	74
<b>13</b>	<b>FC-BB-2_IP Structure and Concepts</b>	<b>75</b>
13.1	Applicability and Related Clauses	75
13.2	FC-BB-2_IP Overview	75
13.3	VE_Port Functional Model	76

13.3.1	FC-BB-2_IP Interface Protocol Layers	76
13.3.2	E_Port/F_Port FC Interface	76
13.3.3	FC-BB-2_IP Protocol Interface	76
13.3.3.1	Major Components	76
13.3.3.2	FC Switching Element (SE) with FC Routing	77
13.3.3.3	FC and FCIP Entities	78
13.3.3.4	VE_Port Virtual ISL Exchanges	80
13.3.3.5	Control and Service Module (CSM)	81
13.3.3.6	Platform Management Module (PMM)	82
13.3.4	IP Network Interface	84
13.4	The B_Access Functional Model	84
13.4.1	FC-BB-2_IP Interface Protocol Layers	84
13.4.2	B_Port FC Interface	84
13.4.3	FC-BB-2_IP Protocol Interface	85
13.4.3.1	Major Components	85
13.4.3.2	FC and FCIP Entities	85
13.4.3.3	B_Access Virtual ISL Exchanges	87
13.4.3.4	B_Port Control and Service Module (CSM)	90
13.4.3.5	B_Port Platform Management Module (PMM)	90
13.4.4	IP Network Interface	90
13.5	FC-BB-2_IP Network Topologies	91
<b>14</b>	<b>Mapping and Message Encapsulation using TCP/IP</b>	<b>93</b>
14.1	Applicability	93
14.2	Encapsulated Frame Structures	93
14.2.1	FC frame Encapsulation Structure	93
14.2.2	Encapsulated FCIP Special Frame (FSF) structure	94
14.3	TCP/IP Encapsulation	95
<b>15</b>	<b>The FC-BB-2_IP Protocol Procedures</b>	<b>96</b>
15.1	Applicability	96
15.2	FC-BB-2_IP Protocol Procedures	96
15.3	Procedures for Platform Management	96
15.3.1	Function	96
15.3.2	Procedures for Discovery	96
15.3.3	Procedures for Extending FC-SP Security	96
15.3.3.1	Authentication Mechanisms	96
15.3.3.2	Authenticate Special Frame (ASF)	97
15.4	Procedures for Connection Management	98
15.4.1	Function	98
15.4.2	Procedures for Link Setup	98
15.4.3	Procedures for Data Transfer	99
15.4.4	Procedures for FCIP Link Disconnection	99
15.4.5	Procedures for Multiple Connection Management	99
15.5	Procedures for Error Detection Recovery	100
15.5.1	Procedures for Handling Invalid FC frames	100
15.5.2	Procedures for Error Recovery	100
15.6	List of FC-BB-2_IP System Parameters	101
15.6.1	FC Timers	101
15.6.2	TCP Timers	101
15.6.3	Maximum number of attempts to complete an Encapsulated FC Frame transmission	101
15.6.4	Maximum number of outstanding Encapsulated FC Frames	101

<b>16 FC-BB-2_IP Service Considerations</b> .....	<b>102</b>
16.1 Applicability .....	102
16.2 Latency Delay .....	102
16.3 Throughput .....	102
16.3.1 How Timeouts affect Throughput .....	102
16.3.2 How loss affects Throughput .....	102
16.3.3 Other factors that affect Throughput .....	102
16.4 Reliability .....	103
16.4.1 Loss of Connectivity .....	103
16.4.2 Loss of Synchronization .....	103
16.4.3 Loss or Corruption of TCP Segments .....	103
16.4.4 Loss or Corruption of FC frames .....	103
16.4.5 FCIP Error Reporting .....	103
16.5 Quality of Service (QoS) .....	104
16.6 Delivery Order .....	104
16.7 IP Multicast and Broadcast .....	104
16.8 Security and Authentication .....	104
<b>Annex A (normative) Encoded SOF and EOF Ordered Sets</b> .....	<b>105</b>
A.1 Ordered Sets .....	105
A.2 SOF and EOF OS-Codes .....	105
A.3 FC-BB-2 SOF OS codes .....	106
A.4 FC-BB-2 EOF OS codes .....	106
<b>Annex B (informative) ATM Traffic Management and Signaling</b> .....	<b>108</b>
B.1 ATM Traffic Management .....	108
B.2 ATM QoS Parameters .....	108
B.3 ATM Traffic Parameters .....	111
B.4 ATM Service Categories .....	112
B.5 ATM Adaptation Layer (AAL) Types .....	114
B.6 ATM Multiplexing .....	114
B.7 Summary of ATM Services and Guarantees .....	115
B.8 ATM Signaling UNI Standard .....	115
<b>Annex C (informative) SR Protocol Parameter Guidelines and State Diagram</b> .....	<b>118</b>
C.1 Assumptions .....	118
C.2 Calculated Ack Delay (T2) Timer variable .....	118
C.3 Calculated Window size .....	118
C.4 Calculated Ack (T1) Timer variable .....	118
C.5 SR Protocol State Diagram .....	119
<b>Bibliography</b> .....	<b>121</b>

**Figure**

Figure 1 – Scope and components of FC-BB-2 specification . . . . .	11
Figure 2 – FC-BB-2_ATM Reference Model . . . . .	24
Figure 3 – FC-BB-2_SONET Reference Model . . . . .	25
Figure 4 – FC-BB-2_IP Reference Model. . . . .	25
Figure 5 – SR Flow Control Protocol Between two BBWs . . . . .	41
Figure 6 – FC-BB-2_ATM Network Configuration . . . . .	54
Figure 7 – FC-BB-2_ATM Functional Block Diagram. . . . .	56
Figure 8 – AAL5 Mapping of a BBW message with SFC . . . . .	59
Figure 9 – AAL5 Mapping of a BBW message with SR. . . . .	60
Figure 10 – Recommended ATM Bandwidth Allocation for multiple VCs . . . . .	61
Figure 11 – FC-BB-2_SONET Network Configuration . . . . .	64
Figure 12 – FC-BB-2_SONET Functional Block Diagram. . . . .	66
Figure 13 – SONET SPE HDLC Mapping Example. . . . .	71
Figure 14 – Path Signal label: C2 . . . . .	71
Figure 15 – Encapsulation of BBW message into HDLC frame using SFC. . . . .	72
Figure 16 – Encapsulation of BBW message into HDLC frame using SR. . . . .	73
Figure 17 – FC-BB-2_IP Network Configuration. . . . .	75
Figure 18 – FC-BB-2_IP VE_Port Functional Model. . . . .	77
Figure 19 – FC-BB-2_IP Protocol Layers. . . . .	78
Figure 20 – Scope of VE_Port Virtual ISL . . . . .	80
Figure 21 – Security Layers. . . . .	83
Figure 22 – FC-BB-2_IP B_Access Functional Model. . . . .	86
Figure 23 – Scope of B_Access Virtual ISL . . . . .	87
Figure 24 – B_Access Initialization State Machine. . . . .	90
Figure 25 – FC-BB-2_IP Network Topologies . . . . .	92
Figure 26 – TCP/IP Encapsulation of an Encapsulated FC Frame . . . . .	95
Figure B.1 – Cell Transfer Delay Distribution . . . . .	110
Figure B.2 – SVC Signaling at the UNI and Switched payload. . . . .	117
Figure C.1 – SR Protocol State Diagram. . . . .	119

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**Table**

Table 1 – FC-BB-2 Organization . . . . .	12
Table 2 – ISO and International Conventions . . . . .	23
Table 3 – Specification and FC Port Types Supported . . . . .	24
Table 4 – FC-BB-2 SW_ILS Codes . . . . .	28
Table 5 – FC-BB-2 ELS Codes . . . . .	28
Table 6 – BBW message structure . . . . .	29
Table 7 – LLC/SNAP Header . . . . .	29
Table 8 – SNAP PID . . . . .	30
Table 9 – BBW_Header . . . . .	30
Table 10 – Flow Control Protocol Type Encodings . . . . .	30
Table 11 – BBW message payload structure for SFC . . . . .	31
Table 12 – BBW message payload structure for SR . . . . .	31
Table 13 – SR_Header format . . . . .	32
Table 14 – SS bits encoding . . . . .	32
Table 15 – MMMMM bit encoding . . . . .	32
Table 16 – SR_BBW messages . . . . .	33
Table 17 – SR_I message format . . . . .	35
Table 18 – SR_SREJ payload format . . . . .	36
Table 19 – SR_FRMR payload format . . . . .	38
Table 20 – Mapping of BBW messages to AAL5 CPCS . . . . .	58
Table 21 – ATM VBR-NRT Service Specification . . . . .	62
Table 22 – SONET/SDH Data Rates . . . . .	66
Table 23 – Mapping of BBW messages to HDLC format . . . . .	69
Table 24 – FC-BB-2_SONET Protocol Stack . . . . .	71
Table 25 – LKA payload . . . . .	81
Table 26 – LKA Accept payload . . . . .	81
Table 27 – EBP Request payload . . . . .	87
Table 28 – EBP Accept payload . . . . .	88
Table 29 – EBP Reject Reason Code Explanation . . . . .	88
Table 30 – TCP/IP Segment structure carrying Encapsulated FC Frame . . . . .	93
Table 31 – Encapsulated FC Frame structure . . . . .	93
Table 32 – TCP/IP Segment structure carrying Encapsulated FSF . . . . .	94
Table 33 – Encapsulated FSF structure . . . . .	94
Table 34 – ASF Request Payload . . . . .	97
Table 35 – ASF Accept Response Payload . . . . .	98
Table A.1 – Byte-encoded frame delimiter format . . . . .	105
Table A.2 – OS-Code Definition . . . . .	105
Table A.3 – FC-BB-2 SOF Codes . . . . .	106
Table A.4 – FC-BB-2 EOF Codes . . . . .	106
Table B.1 – I.356 defined QoS Parameters for different Traffic Classes . . . . .	111
Table B.2 – Service Categories and its Traffic and QoS Attributes . . . . .	113
Table B.3 – ATM Service Categories and Guarantees . . . . .	115

## INFORMATION TECHNOLOGY - FIBRE CHANNEL-

### PART 241: Backbone 2 (FC-BB-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.
- 2) In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.
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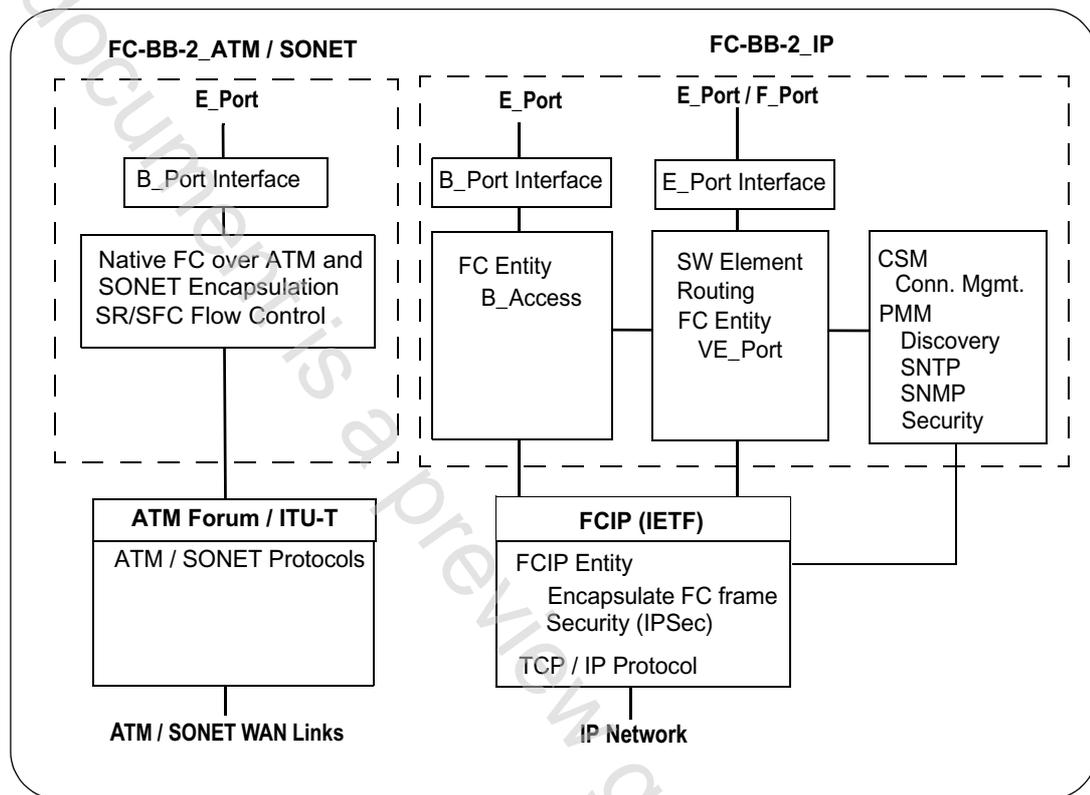
International Standard ISO/IEC 14165-241 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

References in square brackets [n] are either in 2.1, 2.2 or the bibliography.

## INTRODUCTION

International Standard ISO/IEC 14165-241 consists of three distinct Fibre Channel mappings as specified in Clause 1.

Figure 1 illustrates the major components of the FC-BB-2 specification and its relationship to IETF draft-ietf-ips-fcovertcpip-12 (FCIP) and the ATM Forum / ITU-T standards. Table 1 shows the organization of this document. FC-BB-2\_IP, FC-BB-2\_ATM and FC-BB-2\_SONET do not interoperate in any way and are independent specifications.



**Figure 1 – Scope and components of FC-BB-2 specification**

FC-BB-2 is divided into 16 clauses and 3 annexes as follows:

Clause 1 - Scope

Clause 2 - Normative references

Clause 3 - Definitions, abbreviations and conventions

Clause 4 - FC-BB-2 reference models and requirements

Clause 5 - Messages and formats for the ATM and SONET mappings

Clause 6 - Flow control protocols used in conjunction with ATM and SONET mappings

Clause 7 - FC-BB-2\_ATM model structure

Clause 8 - Mapping and message encapsulation used with ATM mapping

Clause 9 - FC-BB-2\_ATM service considerations

Clause 10 - FC-BB-2\_SONET model structure

Clause 11 - Mapping and message encapsulation used with SONET mapping

Clause 12 - FC-BB-2\_SONET service considerations

Clause 13 - FC-BB-2\_IP model structure

Clause 14 - Mapping and message encapsulation used with TCP/IP mapping

Clause 15 - FC-BB-2\_IP protocol procedures

Clause 16 - FC-BB-2\_IP service considerations

Annex A (normative) - Encoded SOF and EOF ordered sets

Annex B (informative) - ATM traffic Management and signalling

Annex C (informative) - SR protocol parameter guidelines and state diagram

**Table 1 – FC-BB-2 Organization**

<b>Specification Type</b>	<b>Applicable Clauses and Annexes</b>
FC-BB-2_ATM, FC-BB-2_SONET, FC-BB-2_IP	1-4
FC-BB-2_ATM, FC-BB-2_SONET	5, 6
FC-BB-2_ATM	7, 8, 9 Annexes A, B, C
FC-BB-2_SONET	10, 11, 12 Annexes A, C
FC-BB-2_IP	13, 14, 15, 16 Annex A

## INFORMATION TECHNOLOGY – FIBRE CHANNEL –

### PART 241: Backbone 2 (FC-BB-2)

#### 1 Scope

This part of ISO/IEC 14165 defines mappings for transporting Fibre Channel frames across ATM, SONET and TCP/IP backbone networks.

This part of ISO/IEC 14165 consists of three distinct Fibre Channel mappings resulting in the following three specifications:

- FC-BB-2\_ATM (FC over ATM backbone network)
- FC-BB-2\_SONET (FC over SONET backbone network)
- FC-BB-2\_IP (FC over TCP/IP backbone network)

The backbone mappings support the attachment of fibre channel switches using the facilities of the underlying backbone network. Mappings of fibre channel to ATM and SONET are completely specified in this FC-BB-2 standard. With respect to TCP/IP, the FC-BB-2 and IETF Fibre Channel over TCP/IP specifications together describe how Fibre Channel frames are transported over a TCP/IP backbone. The FC-BB-2 standard describes the Fibre Channel characteristics associated with the encapsulation and transportation of Fibre Channel frames using Fibre Channel over TCP/IP. The IETF specifications provide details regarding the encapsulation and transportation of Fibre Channel frames over a TCP/IP backbone.

#### 2 Normative 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.

##### 2.1 Approved references

- [1] ISO/IEC 8802-2, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 2: Logical link control*
- [2] ISO/IEC 14165-131, *Information technology – Fibre Channel – Part 131: Switch Fabric requirements (FC-SW-3)*
- [3] ISO/IEC 14165-241, *Information technology – Fibre Channel – Part 241: Backbone 2 (FC-BB-2) [the present publication]*
- [4] ISO/IEC 14165-251, *Information technology – Fibre Channel – Part 251: Framing and Signaling (FC-FS)*
- [5] ITU-T Recommendation X.25-1997, *Interface between Data Terminal Equipment (DTE) and Data Circuit-Terminating equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit, X.25-1997*

##### 2.2 Other references

For information on the current status of the listed documents, or regarding availability, contact the relevant organization.

- [6] T11/Project 1570D/Rev. x.x, *Information Technology - Fibre Channel - Security Protocol (FC-SP)*
- [7] IETF draft-ietf-ips-fcovertcpip-12.txt, *Fibre Channel Over TCP/IP (FCIP)*, August 2002
- [8] IETF draft-ietf-ips-fcip-slp-04.txt, *Finding FCIP Entities Using SLP*, September 2002
- [9] IETF draft-ietf-ips-fcencapsulation-08.txt, *FC frame Encapsulation*, May 2002
- [10] IETF RFC 1619, *PPP over SONET/SDH*, May 1994.
- [11] IETF RFC 1662, *PPP in HDLC-like Framing*, July 1994.
- [12] IETF RFC 2030, *Simple Network Time Protocol (SNTP) Version 4 for IPv4, IPv6 and OSI*, October 1996

### 3 Definitions and Conventions

#### 3.1 Common Definitions

**3.1.1 BBW:** Refers to either FC-BB-2\_ATM or FC-BB-2\_SONET device

**3.1.2 B\_Port:** A Bridge port on a device that implements FC-BB-2\_ATM, FC-BB-2\_SONET, or FC-BB-2\_IP and connects to a FC switch on an E\_Port

**3.1.3 B\_Port\_Name:** A Name\_Identifier that identifies a B\_Port for identification purposes. The format of the name is specified in FC-FS. Each B\_Port provides a unique B\_Port\_Name within the Fabric.

**3.1.4 BSW:** Defined in FC-SW-3 and used as a generic term for a Backbone Switch

**3.1.5 E\_Port:** As defined in FC-SW-3, a Fabric expansion port that attaches to another E\_Port to create an Inter-Switch Link.

**3.1.6 E\_Port\_Name:** A Name\_Identifier that identifies an E\_Port for identification purposes. The format of the name is specified in FC-FS. Each E\_Port provides a unique E\_Port\_Name within the Fabric.

**3.1.7 Fabric\_Name:** A Name\_Identifier associated with a Fabric.

**3.1.8 F\_Port:** As defined in FC-SW-3, a F\_Port is a port to which non-loop N\_Ports are attached to a Fabric, and does not include FL\_Ports.

**3.1.9 F\_Port\_Name:** A Name\_Identifier that identifies a F\_Port for identification purposes. The format of the name is specified in FC-FS. Each F\_Port provides a unique F\_Port\_Name within the Fabric.

**3.1.10 Fabric Initialization:** A process for configuring and building a Fabric, as defined in FC-SW-3.

**3.1.11 FC-BB-2\_ATM:** A physical ATM WAN interface specification that interfaces with Fibre Channel switched network on one side and ATM on the other.

**3.1.12 FC-BB-2\_SONET:** A SONET/SDH WAN interface specification that interfaces with Fibre Channel switched network on one side and SONET/SDH on the other.

**3.1.13 FC-BB-2\_IP:** A logical specification that interfaces with Fibre Channel switched network on one side and IP on the other.