FC Encapsulation for IETF ips WG

Ralph Weber
Brocade Communications
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Elements of Encapsulation

Delimiters	(required)	
Header	(required)	
SOF	(required)	FC frame
FC frame content	(required)	
EOF	(required)	

Order of discussion

- Header
- Header Extensions
- Delimiters
- FC Frame Content

FC Encapsulation Header

	31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0					
0	Vers	r	Frame Length	P/N	X	r	-Frame Length
1	Protocol Specific						
2	Time Stamp [integer]						
3	Time Stamp [fraction]						
4	-Checksum			Checksum			

- ✔ Vers = Version = 0x1
- ✔ Frame Length = words in Encapsulation from 1st Delimiter to end inclusive (-Frame Length = 1's complement)
- ✔ P/N = Protocol Number (IANA assigned, RFC 1700)
- ✔ X = 1 ==> Header Extension(s) present

FC Encapsulation Header

	31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0					
0	Vers	r	Frame Length	P/N	X	r	-Frame Length
1	Protocol Specific						
2	Time Stamp [integer]						
3	Time Stamp [fraction]						
4	-Checksum			Checksum			

- ✔ Protocol Specific is 1 word whose contents are specified by the protocol (FCIP or iFCP or …)
- ✔ Time Stamp [integer] & [fraction] are as defined in SNTP Version 4, RFC 2030
- ✔ Checksum & -Checksum are simple checksum of Delimiter and Header

FC Encapsulation Header Extension

	31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16	15 14 13 12	11	10 9 8	7 6 5 4 3 2 1 0
0	Ex Type	Length	P/N	X	rsv	-Length
1	Extension Specific Fields				
n					

- ✔ Extension Type (IANA assigned, RFC 1700)
- ✔ Length (-Length) = words in extension header
- ✔ P/N is identical to value in header
- ✔ X = 1 ==> Another Header Extension follows
- ✔ Extension Specific Fields are based on content of Ex Type field

Extensions defined solely to satisfy IESG charter, *<u>no known uses exist</u>*

FC Encapsulation Delimiters

- ✔ 4 words of 0xFCFCFCFC
- ✔ Note: proposed word stuffing (or any kind of stuffing) has been dropped

FC Frame

SOF
FC frame content
EOF

- ☆ Frame Content can be byte-for-byte encoded in TCP/IP
- ☆ SOF & EOF
  - 8b/10b in Fibre Channel
  - Must be encoded for TCP/IP

FC Frame Encapsulation

	31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0	
0	SOF	-SOF	reserved
1	Frame Contents		
n	EOF	-EOF	reserved

SOF	Code
SOFf	0x28
SOFi2	0x2D
SOFn2	0x35
SOFi3	0x2E
SOFn3	0x36

EOF	Code
EOFn	0x41
EOFt	0x42
EOFni	0x49
EOFa	0x50