



How Much Power do YOU Have?

FC-LS-3

12/03/2012 (12-454v0)

01/05/2013 (13-030v0)

06/03/2013 (13-030v1)

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The “Problem”

- When link errors occur, it is difficult to find the failing component quickly
 - SFP on one end
 - Fiber in between
 - SFP on the other end
- It would be even better if there was a proactive way to see a link was degrading from a single place

RDP To The Rescue

- Proposal: New ELS, Report Diagnostic Parameters (RDP)
 - Returns diagnostic information from the port including
 - Transceiver Module temperature
 - Transceiver Input Bias Current and Voltage
 - Transceiver Transmit and receive power
 - Link Error Status (LESB)
 - Port Speed
 - Addressing rules exactly the same as RLS ELS
 - Can be addressed to the switch or another N_Port
 - Transceiver diags are those defined in SFF-8472 in the 2-wire address "A2" real time diagnostics and control registers bytes 96-105 that are read from the transceiver.
- A single entity could get a fabric wide view of all links (except ISLs)
- Any port can get a view of the other end of the link

RDP Request

Bits Word	31 ... 24	23 ... 16	15 ... 8	7 ... 0
0	RDP (XXh)	00	00	00
1	Descriptor List (Payload) Length = 12			
2-4	Port_ID Descriptor			

An RDP may be addressed to:

- a) to any Domain Controller well known address (FFFCxxh);
- b) to the F_Port Controller Well-known address (FFFFEh); or
- c) to any Nx_Port N_Port ID

Reply Sequence

A?

Bits Word	31 ... 24	23 ... 16	15 ... 8	7 ... 0
0	LS_ACC (02h)	00	00	00
1-3	Link Service Request Information Descriptor			
4	Diagnostic Parameter Descriptor List (Payload) Length ((n-1)*4) bytes)			
5-n	Diagnostic Parameter Descriptors			

or

B?

Bits Word	31 ... 24	23 ... 16	15 ... 8	7 ... 0
0	LS_ACC (02h)	00	00	00
1	Diagnostic Parameter Descriptor List (Payload) Length ((n-1)*4) bytes)			
2-4	Link Service Request Information Descriptor			
5-n	Diagnostic Parameter Descriptors			

Target of the Request

- a) If the D_ID is a Domain Controller well known address (FFFCxxh), the Port_ID in the Port_ID descriptor shall be set to an N_Port_ID within the associated domain. The diagnostic parameters requested are for the Fx_Port through which the Port_ID is logged in;
- b) if the D_ID is the F_Port Controller Well-known address (FFFFFEh), the Port_ID in the Port_ID descriptor shall be set to the S_ID of the request. The diagnostic parameters requested are for the Fx_Port through which the Port_ID is logged in; or
- c) for all other D_IDs, the Port_ID in the Port_ID descriptor shall be set to the D_ID of the request. The diagnostic parameters requested are for Nx_Port to which the D_ID is assigned.

Diagnostic Parameters Descriptor List

Item	Size (bytes)
SFP Diagnostics Descriptor tag = a	4
SFP Diagnostics Descriptor Length (12)	4
SFP Diagnostics Descriptor	12
Port Speed Descriptor tag = b	4
Port Speed Descriptor Length (4)	4
Port Speed Descriptor	4
LESB Descriptor tag = c	4
LESB Length (24)	4
LESB Descriptor	24
Local Port Names Descriptor tag = d	4
Port Names Descriptor Length (16)	4
Local Port Names	16
Attached Port Names Descriptor tag = e	4
Port Names Descriptor Length (16)	4
Attached Port Names	16



PLUS, Port_ID Descriptor
for the request

Port_ID Descriptor

A?

Bits Word	31 ... 24	23 ... 16	15 ... 8	7 ... 0
0	Port_ID Descriptor tag = e			
1	Port_ID Descriptor Length (4)			
2	reserved	Port_ID		

or

B?

Item	Size (bytes)
Descriptor tag = e	4
Descriptor length = 4	4
reserved	1
Port_ID	3

or

Item	Size (bytes)
Descriptor tag = e	4
Descriptor length = 3	4
Port_ID	3

YUK!

SFP Diagnostics Descriptor

Bits Word	31 ... 24	23 ... 16	15 ... 8	7 ... 0
0	SFP Diagnostics Descriptor tag = a			
1	SFP Diagnostics Descriptor Length (12 bytes)			
2	Temperature		Vcc	
3	Tx Bias		Tx Power	
4	Rx Power		Flags	

Diagnostics attributes are as specified in SFF-8472 – Diagnostic Monitoring Interface for Optical Transceivers

Temperature: Internally measured transceiver temperature in units of 1/256 C (Range -128C to + 128C)

Vcc: Internally measured supply voltage in units of 100uV (Range 0-6.55V)

Tx Bias: Measured transmitter laser bias current in units of 2 uA (Range 0 – 131mA)

Tx Power: Measured coupled TX output power in units of 0.1 uW (Range 0-6.5mW)

Rx Power: Measured received optical power in units of 0.1 uW (Range 0-6.5mW)

Flags:

Flags bit 0 = Port State; 0=Not Operational; 1=Operational

Flags bit 1-2 = Optics Type; 00b=Short wave; 01b=Long Wave Laser LC 1310nm; 10b=Long Wave Laser LL 1550nm, 11b-n/a

Flags bit 3 = Sync State; 0=No Rx Sync; 1=Rx Sync established

Flags bit 4 = Optical Port ; 0=Optical Port; 1=Not Optical

Flags bits 5-15 Reserved

Port Speed Descriptor

Bits Word	31 ... 24	23 ... 16	15 ... 8	7 ... 0
0	Port Speed Descriptor tag = b			
1	Port Speed Descriptor Length (4 bytes)			
2	Port Speed Capabilities		Port Operating Speed	

- Port Speed Capabilities and Port Operating Speed are as defined for RPSC in FC-LS-3 4.2.36.4

a) **Port Speed Capabilities:**

Identifies the operating speed capabilities of the port

Bit 31 – 1 Gb capable,
 Bit 30 – 2 Gb capable,
 Bit 29 – 4 Gb capable,
 Bit 28 – 10 Gb capable,
 Bit 27 – 8 Gb capable,
 Bit 26 – 16 Gb capable,
 Bit 25 – 32 Gb capable
 Bits 24 through 17 – reserved,
 Bit 16 - Unknown; and

c) **Port Operating Speed:** Identifies the current operating speed if set.

Bit 15 – 1 Gb Operation,
 Bit 14 – 2 Gb Operation,
 Bit 13 – 4 Gb Operation,
 Bit 12 – 10 Gb Operation,
 Bit 11 – 8 Gb Operation,
 Bit 10 – 16 Gb Operation,
 Bit 9 - 32 Gb Operation
 Bits 8 through 2 – reserved,
 Bit 1 - Unknown,
 Bit 0 – Speed not established.

Link Error Status Block (LESB) Descriptor

Bits Word	31 ... 24	23 ... 16	15 ... 8	7 ... 0
0	LESB Descriptor tag = c			
1	LESB Descriptor Length (24 bytes)			
2-6	LESB (see FC-FS-3 or FC-BB-6)			
7	VN_Port Phy Type	Reserved		

VN_Port Phy Type:

Word 7 bits 31-30 identify the type of physical interface for the PN_Port or PF_Port through which the request was received.

Table xx

Encoded Value

Description

Word 7 bits 31-30

00b

No Information about Phy Type Provided

01b

The sending VN_Port uses an FC-FS-3 PN_Port or PF_Port

10b

The sending VN_Port uses a lossless Ethernet MAC

11b

Reserved

Port Names Descriptor

Bits Word	31 ... 24	23 ... 16	15 ... 8	7 ... 0
0	Port Names Descriptor tag = d			
1	Port Names Descriptor Length (4 words)			
2-3	WWNN			
4-5	WWPN			

TBD

- Validate units of measure for SFP Diagnostics Descriptor vs. SFF8472 definition and ensure future-proof
- Decide on Descriptor format for FC-LS (table format vs structure format)
- Update text based on above and review

Thank You Descriptor

Bits Word	31 ... 24	23 ... 16	15 ... 8	7 ... 0
0	Thank You Descriptor tag = T			
1	Thank You Descriptor Length = 11			
2-4	THANK YOU!			pad