



FC-LS-5

Fabric Notifications

Is There Anybody Out There?

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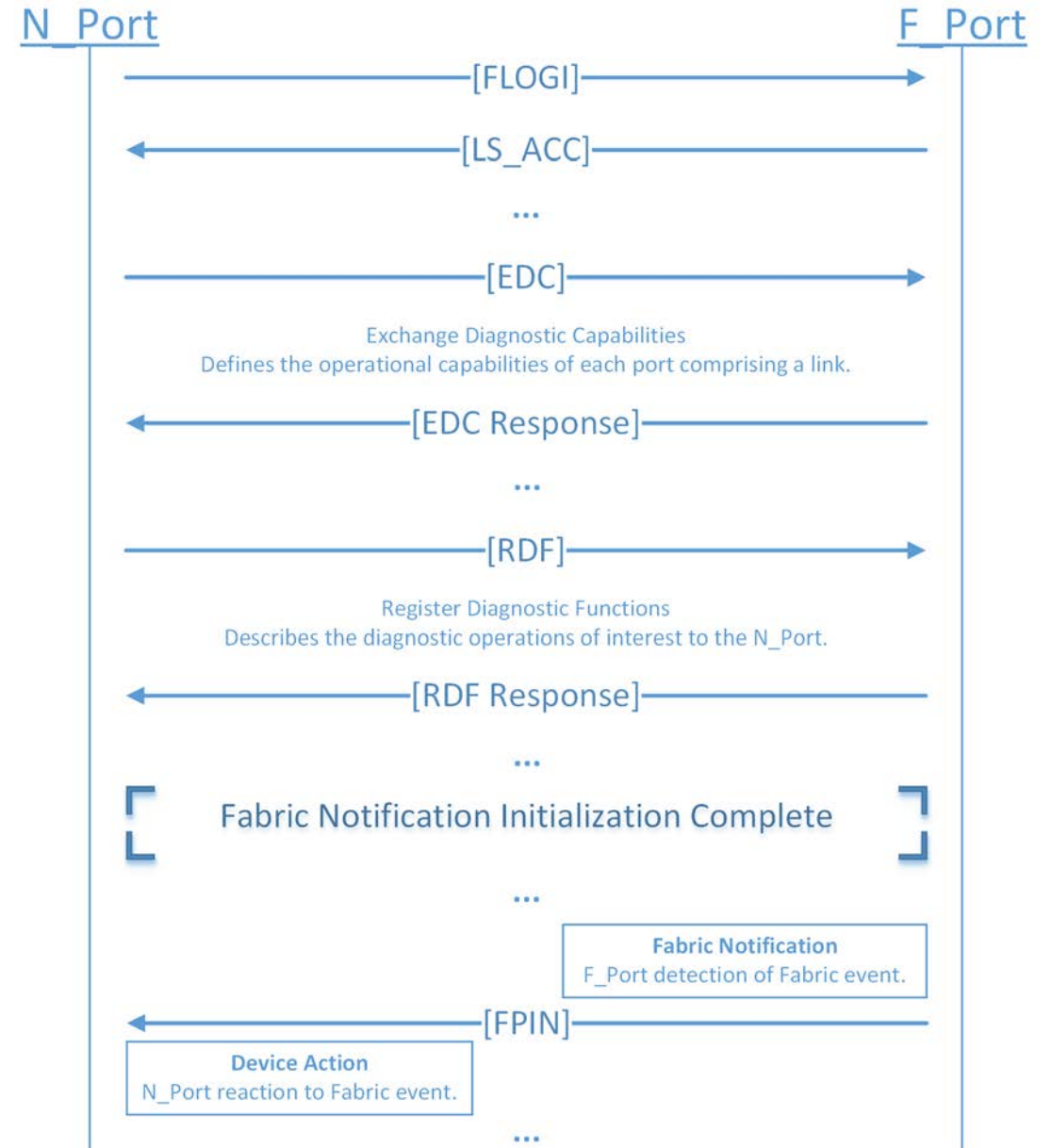
- Basic Protocol
- Registration
 - Exchange Diagnostic Capabilities
 - Register Diagnostic Functions
- Notifications
 - Link Integrity
 - Delivery
 - Congestion
 - Transmission Impediment
- Summary



Basic Protocol

Login, Register, Listen

- Normal fabric login
- Exchange Diagnostic Capabilities
 - N_Port indicates capabilities
 - F_Port responds with capabilities
 - Defines “link” capabilities
- Register Diagnostic Functions
 - N_Port initiates registration
 - Lists functions it wants to listen to
 - F_Port responds to registration request
 - List functions it can generate notifications



Registration

Exchange Diagnostic Parameters

- EDC exchange
 - None indicates N_Port is not capable
 - Blank indicates N_Port knows about ELS but not much else
 - Descriptor list defines range of capabilities

- New Congestion Detection descriptor
 - Note: need to modify response description 😊

- Congestion Detection capabilities
 - Signaling function capabilities
 - I.e. None, Warning, Warning and Alarm, etc
 - Detection frequency capability
 - I.e. X-number of Y-measures
 - Ex. Every 100-milliseconds

Table 180 – EDC Request Payload

Bits Word	31 .. 24	23 .. 16	15 .. 8	7 .. 0
0	EDC (17h)	00h	00h	00h
1	Descriptor list length = ((n-1)*4) bytes			
2 - n	Diagnostic capability descriptors			

Table 181 – EDC LS_ACC Payload

Bits Word	31 .. 24	23 .. 16	15 .. 8	7 .. 0
0	02h	00h	00h	00h
1	Descriptor list length ((n-1)*4) bytes			
2	MSB			
3	Link Service Request Information descriptor (see 4.2.4.2)			
4	LSB			
5 - n	Diagnostic capability descriptors			

Table 182 – Link Fault Capability descriptor

Bits Word	31 .. 24	23 .. 16	15 .. 8	7 .. 0
0	Link Fault Capability Descriptor tag = 0001 000Dh			
1	Descriptor Length = 12			
2	Activate threshold symbol error count			
3	Deactivate threshold symbol error count			
4	RS-FEC code word interval count			

Registration

Register Diagnostic Functions

- RDF exchange
 - Initiated by the N_Port
 - None indicates N_Port is not capable
 - Blank indicates N_Port doesn't want to listen
 - Descriptor list indicates range of supported functions
- Descriptor list
 - Format mimics EDC
 - Special descriptors describing registered function
 - Parameters of specific registration descriptor define supported elements of the function
- FPIN registration descriptor
 - List of elements supported
 - Link Integrity
 - Delivery
 - Congestion
 - Transmission Impediment

Register Diagnostic Functions ELS

Descriptor list length

List of registration descriptors

FPIN registration descriptor

Descriptor list length

List of descriptor tags

Notifications

Fabric Performance Impact Notification ELS

- Description
 - Sent from the Fabric Controller to the applicable N_Ports
 - Distribution is affected by the zone configuration
 - Describes the performance impacting event and port(s)
- Descriptors
 - Link Integrity
 - Delivery Notification
 - Congestion
 - Transmission Impediment
- Descriptor Content
 - Detecting Port Name
 - Attached Port Name
 - Event Description and Data
 - CRC, LOS, ITW, lost credit, congestion, oversubscription, etc
 - Port list, discarded frame header, etc
- Considerations
 - Detection
 - Existing tools are used to detect conditions leading to congestion issues
 - I.e. Lost credit, credit stalled device, or oversubscription
 - Distribution
 - Sent to peers of an identified port (congestion)
 - Sent to peers and identified port (link integrity)

Fabric Performance Impact Notification ELS

Descriptor list length

Notification descriptors list

Notification Descriptor

Detecting Port Name

Attached Port Name

Event Description and Data

Notifications

Link Integrity descriptor

- **Detection**
 - Detecting and attached port name
 - Indicates location of link integrity issue
- **Description**
 - Event type, modifier, threshold, and count
 - Describes the “trigger” generating the event
 - Note: Implementation specific
- **Affected Ports**
 - List of ports “behind” the attached port that are also affected

Link Integrity descriptor

Detecting Port Name

Attached Port Name

Event Type

Event Modifier

Event Threshold

Event Count

Affected Port List

Notifications

Delivery descriptor

- Detection
 - Detecting and attached port name
 - Indicates location of link integrity issue
- Description
 - Threshold describes the “hold time” violation
 - Note: Implementation specific
- Frame data
 - Header of the discarded frame

Delivery Notification descriptor

Detecting Port Name

Attached Port Name

Threshold

Frame header

Notifications

Congestion descriptor

- Detection
 - Detecting and attached port name
 - Indicates location of link integrity issue
- Description
 - Event type, modifier, and threshold
 - Describes the congestion event
 - Note: Implementation specific
- Affected Ports
 - List of ports “behind” the attached port that are also affected

Congestion descriptor

Detecting Port Name

Attached Port Name

Event Description and Data

Notifications

Transmission Impediment descriptor

- Detection
 - Transmitter determination
- Description
 - Impedance describes severity (warning/alarm)
- Usage
 - Notification indicates when a device is behaving in a congesting manner
 - E.g., credit stall or oversubscription
 - Provides an indication of the severity of the condition
 - Utilizes existing detection mechanisms

Transmission Impediment descriptor

Impedance indicator

Summary

Fabric Notifications

- Surface fabric detected impediments
 - N_Port driven deployment
 - F_Port distribution of events
- Simple notification method
 - RSCN model
 - Device specific response/action
- ELS Enhancements
 - EDC enhanced
 - RDF and FPIN defined
- Are you still there?
 - See you in April 😊



Thank You

Howard Johnson

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End of Frame

Thank you