MPCP Messages

Gaobo & Duane Remein (Huawei)
Glen Kramer (Broadcom)

Motivation

- GATE2 and REPORT2 messages have been agreed on and are in D0.3.
  - The need for and the use of the Force_Report flag is to be discussed separately
- Need to define the remaining MPCPDUs
  - DISCOVERY_GATE2
  - REGISTER_REQ2
  - REGISTER2
  - REGISTER_ACK2

DISCOVERY_GATE2

Key changes:

- New Opcode to facilitate the ONU parser
  - Logically, DISCOVERY_GATE and GATE are different messages with different goals
  - Normal GATE2 uses all the bits, no place to add the Discovery Flag

100G-EPON DISCOVERY_GATE2	Octets
Destination Address	6
Source Address	6
Length/Type = 0x8808	2
Opcode = 0x0017	2
Timestamp	4
Channel Assignment	1
Start Time	4
Discovery Grant Length (EQ)	3
Sync Time	2
Discovery Information	2
Pad/Reserved	28
FCS	4

- Add Channel Assignment as in GATE2
- Discovery Grant Length
- Sync Time as in 10-EPON
- Discovery Information modified (next slide)

GATE2 Discovery Info Field

- **Extension of 802.3av Discovery Information Field**
- **Key Changes:**
  - Define bit 2: ***25G upstream capability***
  - Define bit 6: ***25G window advertisement***

DISCOVERY_GATE2 MPCPDU discovery information fields		
Bit	**Flag field**	**Values**
0	Reserved	0 – OLT does not support 1 Gb/s reception 1 – OLT supports 1 Gb/s reception
1	OLT is 10G upstream capable	0 – OLT does not support 10 Gb/s reception 1 – OLT supports 10 Gb/s reception
2	OLT is 25G upstream capable	0 – OLT does not support 25 Gb/s reception 1 – OLT supports 25 Gb/s reception
3	Reserved	Ignored on Reception
4	OLT is opening 1G discovery window	0 – OLT cannot receive 1 Gb/s data in this window 1 – OLT can receive 1 Gb/s data in this window
5	OLT is opening 10G discovery window	0 – OLT cannot receive 10 Gb/s data in this window 1 – OLT can receive 10 Gb/s data in this window
6	OLT is opening 25G discovery window	0 - OLT cannot receive 25 Gb/s data in this window 1 - OLT can receive 25 Gb/s data in this window (see Channel Assignment field for allowed channels)
7-15	Reserved	Ignore on reception

Note: Definition of bits 2 & 6 assume TDM coexistence between 25G/25G and 25G/10G ONUs

The use of Discovery Info

- The OLT may need to re-tune optical module /bCDR before it can receive 10G and 25G bursts.
- During the discovery, if all ONUs are allowed to participate, the OLT will not know which burst to expect.
- Using the Discovery Information field, the OLT may target exclusively 10/10, 25/10, or 25/25 ONUs.
- This is similar to 1G/1G, 10G/1G, and 10G/10G discovery (see 802.3 Table 77-9)

Note: assumes TDM coexistence

Target ONU Type	LLID of Discovery GATE	Discovery Information			
		Upstream Capability		Discovery Window	
		10G	25G	10G	25G
10G/10G only	0x7FFE	1	x	1	x
25G/10G only	0x0001	1	0	1	0
25G/25G or above	0x0001	x	1	0	1
10G/10G and 25G/10G	0x7FFF	1	0	1	0
	0x0001				
25G/10G and 25G/25G	0x0001	1	1	1	1
All types	0x7FFF	1	1	1	1
	0x0001				

ONU Actions based on Discovery Info

- The ONU should attempt to register during the discovery window announced as supporting the highest upstream channel speed common to both the OLT and ONU.
- If the OLT is capable of 25G reception, but has not opened 25G window (i.e., OLT receiver is tuned to 10G signal), the 25G/25G ONU has to wait for a later 25G discovery window.
- This is similar to 1G/1G, 10G/1G, and 10G/10G discovery (see 802.3 Table 77-10)

Note: assumes TDM coexistence

OLT Discovery Information				ONU Upstream Tx Capability		ONU Action
Upstream Capability		Discovery Window				
10G	25G	10G	25G	10G	25G	
1	0	1	0	1	x	Attempt 10G registration
1	x	1	x	1	0	Attempt 10G registration
x	1	x	1	x	1	Attempt 25G registration
1	1	0	1	1	0	Wait for 10G discovery window
1	1	1	0	x	1	Wait for 25G discovery window

REGISTER_REQ

- Same as 10G-EPON
  - Flags not changed
    - Reregister
    - Deregister
    - Ack
    - Nack
  - Discovery Information modified (see next slide)

100G REGISTER_REQ2	Octets
Destination Address	6
Source Address	6
Length/Type = 0x8808	2
Opcode = 0x0014	2
Timestamp	4
Flags	1
Pending grants	1
Discovery Information	2
Laser On Time	1
Laser Off Time	1
Pad/Reserved	34
FCS	4

REGISTER_REQ Discovery Information

- **Extension of 802.3av REGISTER_REQ Discovery Information Field**
- **Key Changes:**
  - Define bit 2: ***ONU is 25G upstream capable***
  - Define bit 6: ***25G registration attempt***

100G REGISTER_REQ2 MPCPDU Discovery Information Fields		
Bit	**Flag field**	**Values**
0	ONU is 1G upstream capable	0 – ONU transmitter is not capable of 1 Gb/s 1 – ONU transmitter is capable of 1 Gb/s
1	ONU is 10G upstream capable	0 – ONU transmitter is not capable of 10 Gb/s 1 – ONU transmitter is capable of 10 Gb/s
2	ONU is 25G upstream capable	0 – ONU transmitter is not capable of 25 Gb/s 1 – ONU transmitter is capable of 25 Gb/s
3	Reserved	Ignored on Reception
4	1G registration attempt	0 – 1 Gb/s registration is not attempted 1 – 1 Gb/s registration is attempted
5	10G registration attempt	0 – 10 Gb/s registration is not attempted 1 – 10 Gb/s registration is attempted
6	25G registration attempt	0 – 25 Gb/s registration is not attempted 1 – 25 Gb/s registration is attempted
7 - 15	Reserved	Ignored on reception

Note: we might want to expand the number of broadcast LLIDs; one for 25G, one for 50G, and another for 100G.

REGISTER & REGISTER_ACK

- Only new opcode

100G REGISTER2	Octets
Destination Address	6
Source Address	6
Length/Type = 0x8808	2
Opcode = 0x0015	2
Timestamp	4
Assigned Port (PLID)	2
Flags	1
Sync Time	2
Echo Pending grants	1
Target Laser On Time	1
Target Laser Off Time	1
Pad/Reserved	32
FCS	4

100G REGISTER_ACK2	Octets
Destination Address	6
Source Address	6
Length/Type = 0x8808	2
Opcode = 0x0016	2
Timestamp	4
Flags	1
Echo Assigned Port (PLID)	2
Echo Sync Time	2
Pad/Reserved	35
FCS	4

Thank You

Backup

Straw Poll

I agree with the proposed changes to MPCPDUs shown in remein_3ca_2_0517.pdf slides 3-9

Agree: _____

Disagree: _____

Abstain or No Opinion: _____

(Vote for one)

Straw Poll

Regarding the proposed changes shown in remein_3ca_2_0517.pdf:

	agree	disagree
a) Slides 3-6 for DISCOVERY_GATE2	_____	_____
b) Slides 7 & 8 for REGISTER_REQ	_____	_____
c) Slide 8 for REGISTER & REGISTER_ACK	_____	_____

(Chicago rules, for as many as you like)