Channel capability report during registration for 100G-EPON

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Dan Geng
Yong Guo
Weiliang Zhang
Jun Shan Wey

ZTE
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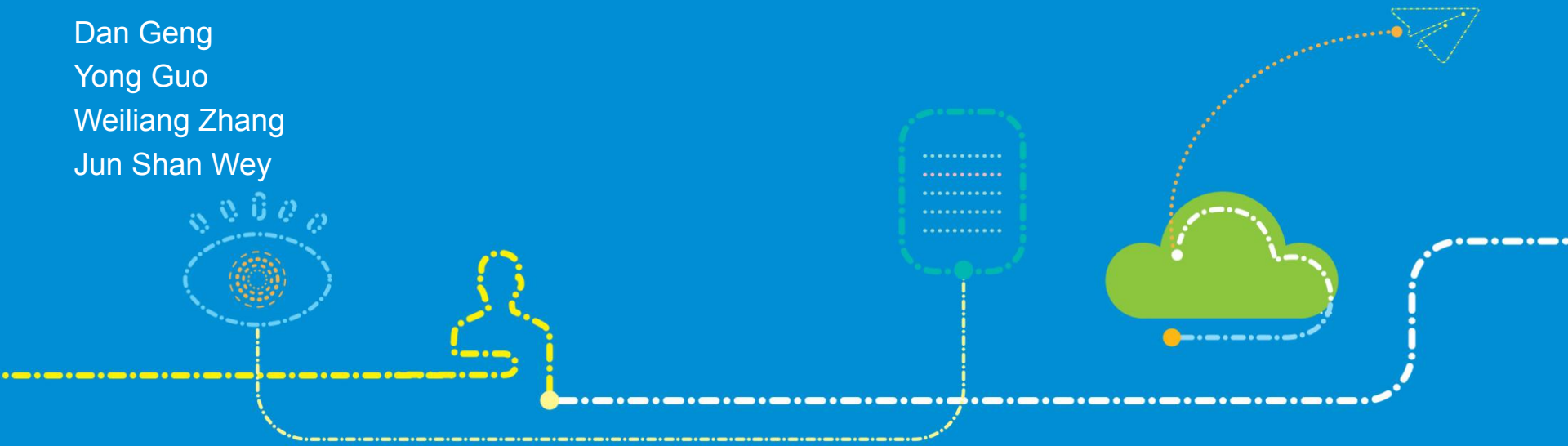

Content

- Introduction of channel capability
- Current registration and related existing MPCPDUs
- Ways of channel capability report
- Registration with channel capability report
- Proposal

ONU channel capability in 100G-EPON

- 100G EPON supports 25G, 50G and 100G ONUs
  - 25G ONU uses wavelength channel 0
  - 50G ONU uses wavelength channels 0 and 1
  - 100G ONU uses wavelength channels 0, 1, 2 and 3
- ONU channel capability includes
  - rate information per channel
  - number of channels
- Report of ONU channel capability helps OLT
  - speed up discovering ONUs,
  - range on supported channels of the ONU
  - bond on supported channels of the ONU

Registration in current 3ca draft

- Existing MPCPDU during registration (see D0.4 3ca or backup slides)
  - DISCOVERY GATE MPCPDU
  - REGISTER_REQ MPCPDU
  - REGISTER MPCPDU
  - REGISTER_ACK MPCPDU
- During current registration process, OLT does not request ONU's channel capability and ONU does not report its own channel capability to OLT

Discussion

- REGISTER_REQ MPCPDU is the first message ONU sends to OLT, so it is the best place to carry and report ONU's channel capability
- There are reserved bits in the Discovery Information Fields of REGISTER_REQ MPCPDU, as shown in Table 144-2

Table 144–2—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 – ONU transmitter is not capable of 1 Gb/s 1 – ONU transmitter is capable of 1 Gb/s
5	10G registration attempt	0 – ONU transmitter is not capable of 10 Gb/s 1 – ONU transmitter is capable of 10 Gb/s
6	25G registration attempt	0 – ONU transmitter is not capable of 25 Gb/s 1 – ONU transmitter is capable of 25 Gb/s
7-15	Reserved	Ignored on Reception

- Bits 8-9 are proposed to be used for channel capability report
  - 00 - 25Gbps ONU, supports channel 0
  - 01 - 50Gbps ONU, supports channels 0-1
  - 10 - 100Gbps ONU, supports channels 0-3
- OLT performs ranging and channel bonding on the ONU-supported channels, based on the reported channel capability

Improved Table 144-2

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 – ONU transmitter is not capable of 1 Gb/s 1 – ONU transmitter is capable of 1 Gb/s
5	10G registration attempt	0 – ONU transmitter is not capable of 10 Gb/s 1 – ONU transmitter is capable of 10 Gb/s
6	25G registration attempt	0 – ONU transmitter is not capable of 25 Gb/s 1 – ONU transmitter is capable of 25 Gb/s
7	Reserved	Ignored on Reception
8-9	ONU Channel capability	00 - 25Gbps ONU, supports channel 0 01 - 50Gbps ONU, supports channels 0-1 10 - 100Gbps ONU, supports channels 0-3 11 - reserved
10-15	Reserved	Ignored on Reception

Registration with channel capability report(example)

- OLT issues DISCOVERY GATE on channel 0, which avoids issuing on every channel to improve efficiency.
- ONU responds by REGISTER_REQ with channel capability on channel 0
- OLT gets the ONU-supported channels and issues REGISTER(s) on these channels
- ONU responds by REGISTER_ACK on each supported channels

Proposals

- We propose using bits 8-9 in Table 144-2 for channel capability report:
  - 00 - 25Gbps ONU, supports channel 0
  - 01 - 50Gbps ONU, supports channels 0-1
  - 10 - 100Gbps ONU, supports channels 0-3
- The improved Table 144-2 is provided
- OLT performs discover/registration on one channel (e.g., channel 0)
- Ranging and channel bonding can be performed on the ONU-supported channels, based on the reported channel capability.

Thank you

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DISCOVERY GATE MPCPDU

DISCOVERY GATE MPCPDU

- Channel Assignment indicates which upstream wavelength can be used
- Start Time indicates the start time of upstream burst
- Discovery information indicates the upstream data rate that can be received in this window

Table 144–3—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
7-15	Reserved	Ignored on Reception

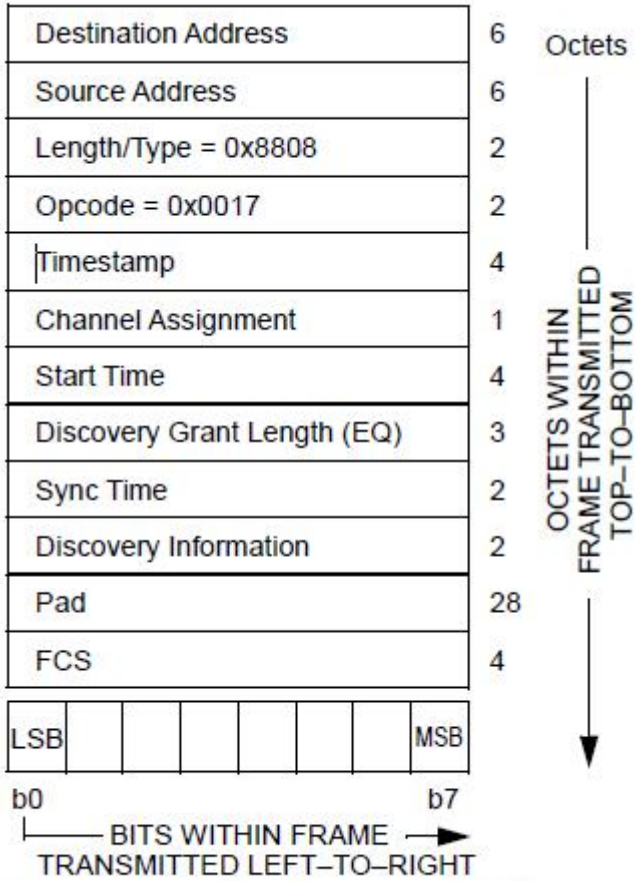

Figure 144–9—DISCOVERY GATE MPCPDU

REGISTER_REQ MPCPDU

REGISTER_REQ MPCPDU

- Discovery Information indicates which upstream data rate is attempted during registration

Table 144–2—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 – ONU transmitter is not capable of 1 Gb/s 1 – ONU transmitter is capable of 1 Gb/s
5	10G registration attempt	0 – ONU transmitter is not capable of 10 Gb/s 1 – ONU transmitter is capable of 10 Gb/s
6	25G registration attempt	0 – ONU transmitter is not capable of 25 Gb/s 1 – ONU transmitter is capable of 25 Gb/s
7-15	Reserved	Ignored on Reception

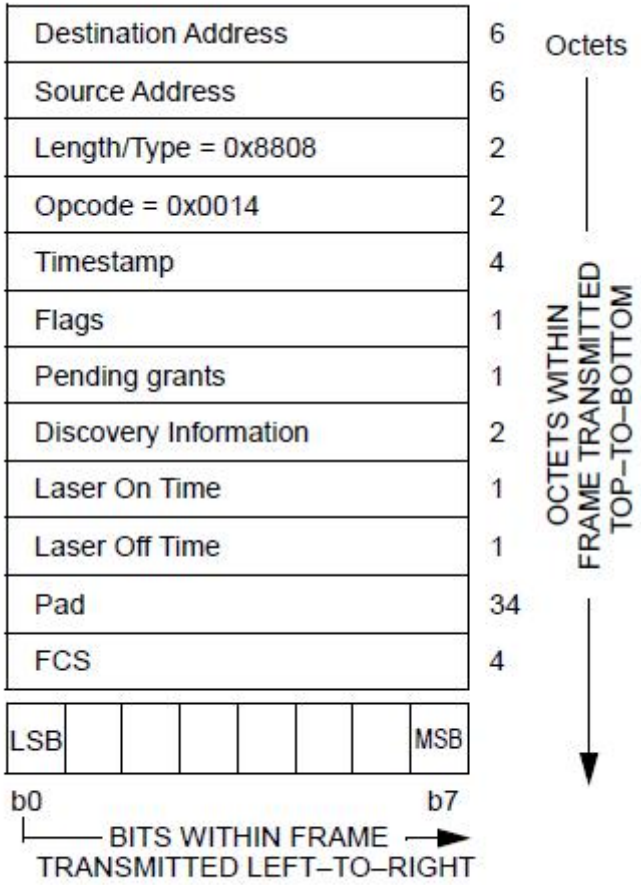

Figure 144–6—REGISTER_REQ MPCPDU

REGISTER MPCPDU

REGISTER MPCPDU

- Assigned Port (PLID) indicates the assigned port link ID for the ONU that is registering

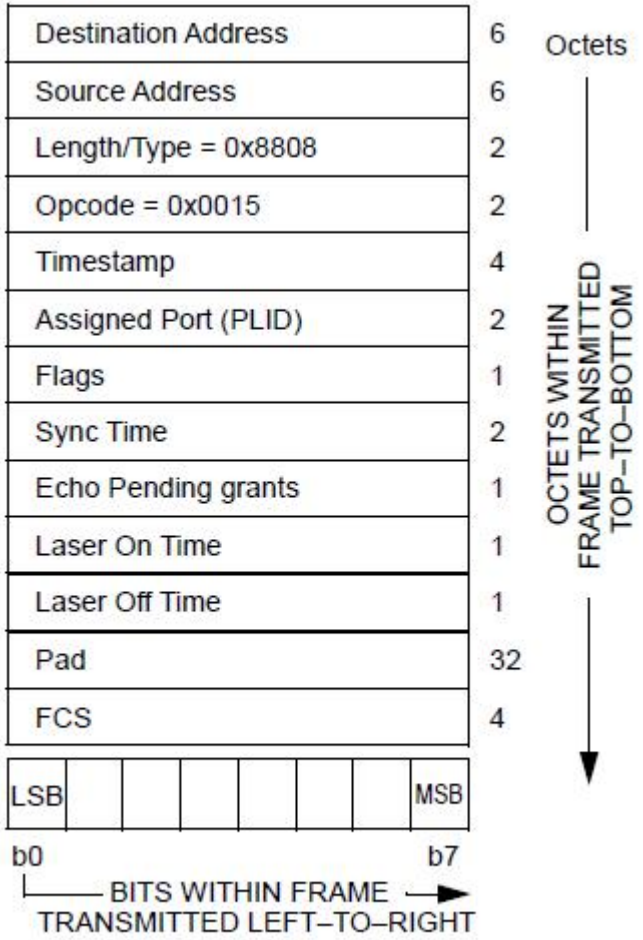

Figure 144–7—REGISTER MPCPDU

REGISTER_ACK MPCPDU

REGISTER_ACK MPCPDU

- Timestamp to help OLT perform ranging for the ONU

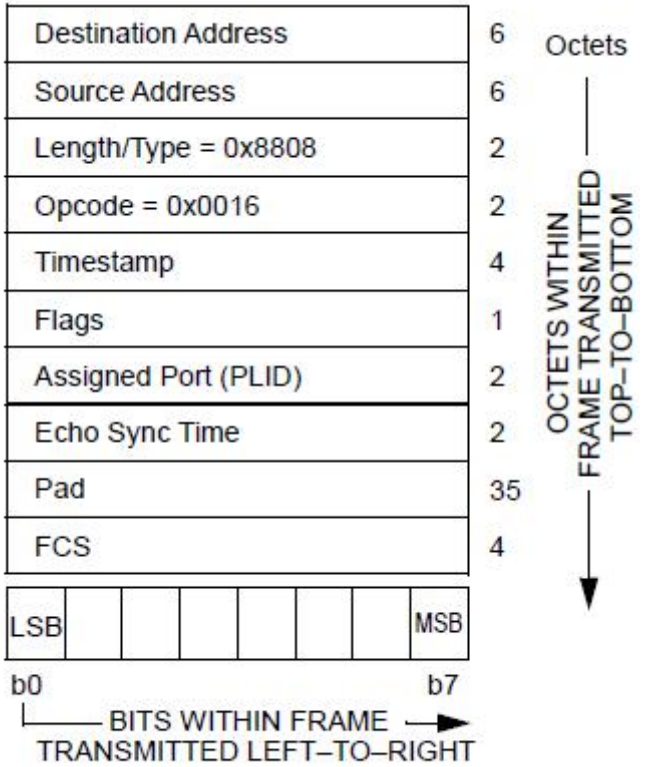

Figure 144–8—REGISTER_ACK MPCPDU