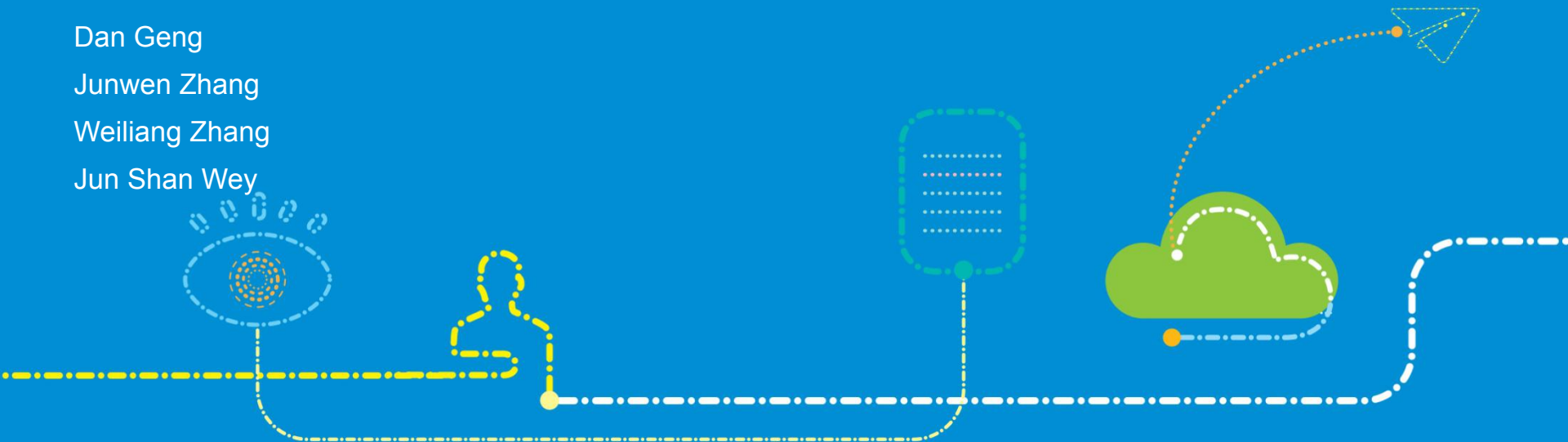


# Channel capability report during registration for 100G-EPON

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# Background

- In the September meeting, we proposed two channel capability reporting methods:
  1. ONU's channel capability is reported during the registration process
  2. ONU's channel capability is reported by eOAM message
- The following comments were received, which are discussed in this contribution
  - What are the advantages that channel capability report in the registration process?
  - How many channels will be used for ranging?

# 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

# Method 1: Reporting DURING registration

- 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
- Reserved bits in the Discovery Information Fields of REGISTER\_REQ MPCPDU (Table 144-2) can be used for channel capability report

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
8-11	ONU Channel capability	(See next page)
12-15	Reserved	Ignored on Reception

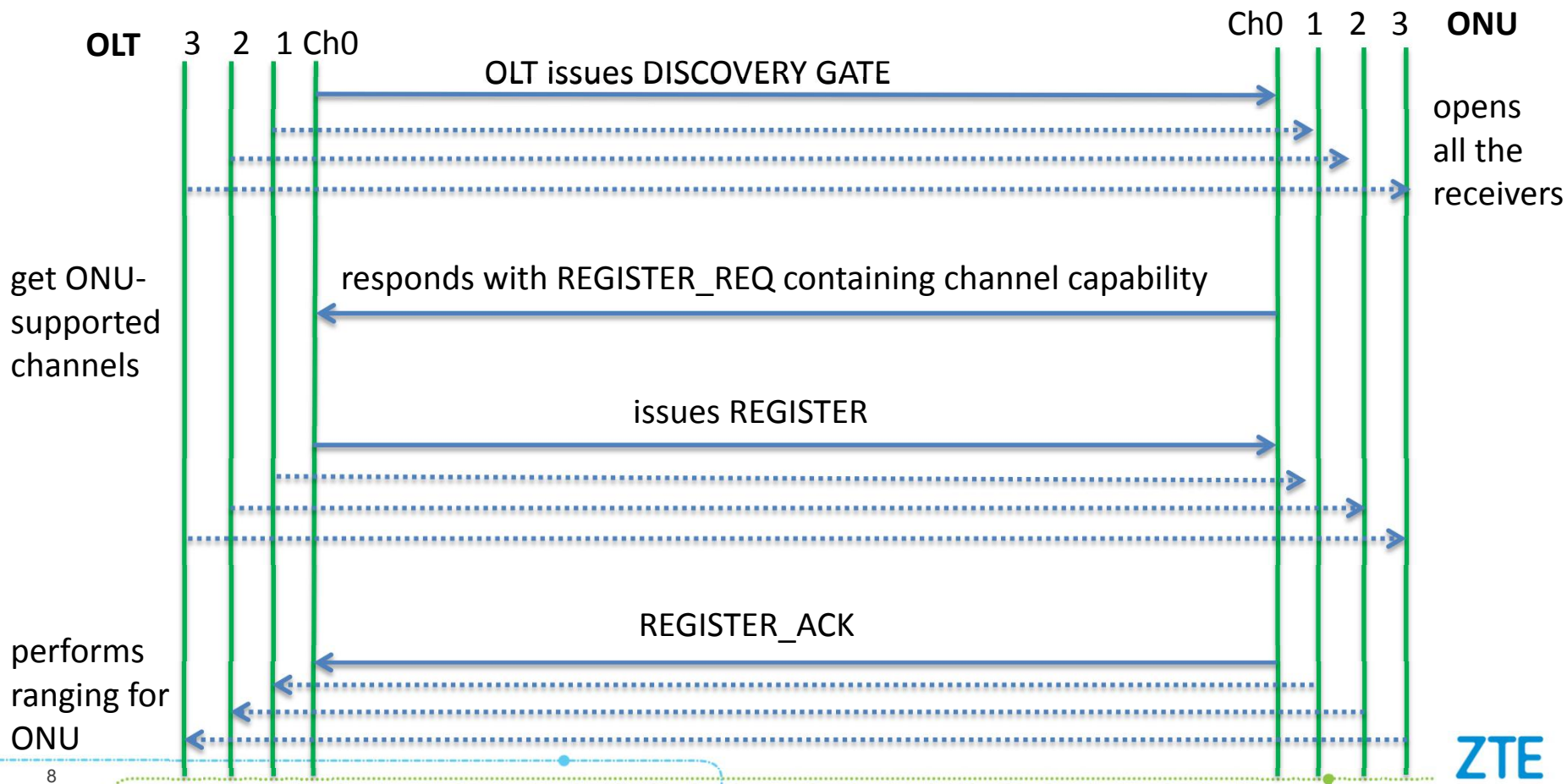
# Proposed bit assignment

Bit 8-11	Rate	CH0	CH1	CH2	CH3
0001	25G	✓			
0010	25G		✓		
0100	25G			✓	
1000	25G				✓
0011	50G	✓	✓		
0101	50G	✓		✓	
1001	50G	✓			✓
1100	50G			✓	✓
0111	100G	✓	✓	✓	✓

# Method 1: Reporting DURING registration

- OLT issues DISCOVERY GATE on some channels
  - OLT issues DISCOVERY GATE on channel 0
  - If there is fault on channel 0, OLT can also issues DISCOVERY GATE on other channels.
- ONU opens all the receivers and responds with REGISTER\_REQ containing channel capability on the channel that ONU receives DISCOVERY GATE the earliest.
- OLT gets the ONU-supported channels and OLT performs ranging for this ONU
  - Option 1: OLT issues REGISTER on one channel.
    - OLT can do ranging for ONU on only one channel, and compute other channels' equalization delay
  - Option 2: OLT issues REGISTER on all the channels supported by this ONU
    - OLT can do ranging for ONU on all the channels supported by this ONU
  - OLT can choose option 1 or option 2, depending on OLT's configuration.
- ONU responds with REGISTER\_ACK on the channels on which ONU receives REGISTER

# Method 1: Reporting DURING registration

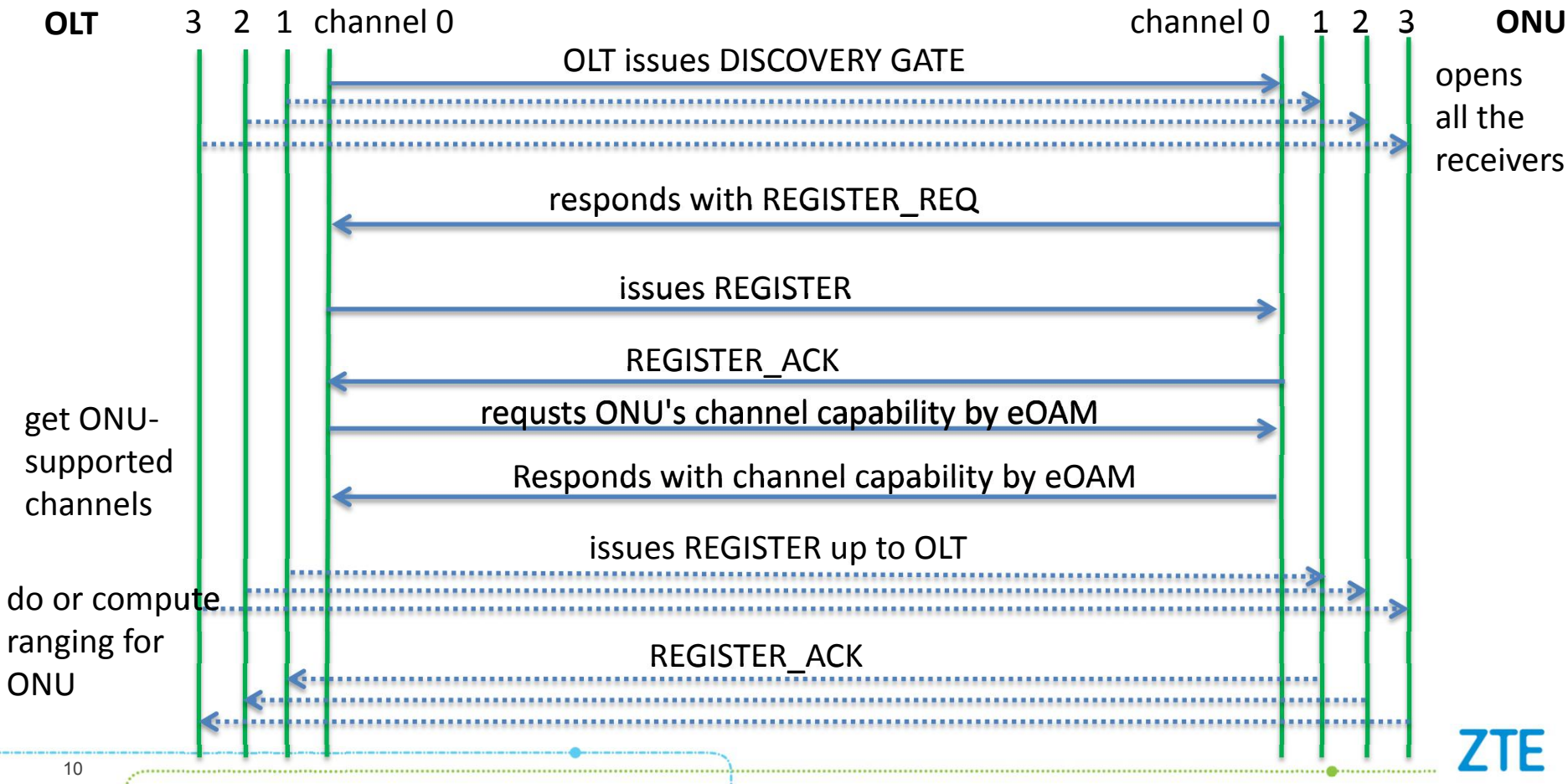




## Method 2: Reporting AFTER registration

- OLT issues DISCOVERY GATE on some channels
  - OLT issues DISCOVERY GATE on channel 0
  - If there is fault on channel 0, OLT issues DISCOVERY GATE on other channels.
- ONU opens all the receivers and responds with REGISTER\_REQ on the channel that ONU receives DISCOVERY GATE the earliest
- OLT issues REGISTER on the channel on which OLT receives REGISTER\_REQ from this ONU
- ONU responds with REGISTER\_ACK on above channels
- OLT request ONU's channel capability by eOAM message
- ONU responds its channel capability to OLT by eOAM message
- OLT gets the ONU-supported channels and OLT can do ranging or computes the equalization delay for other channels supported by the ONU

# Method 2: Reporting AFTER registration



# Summary

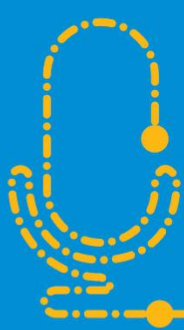
- OLT is able to issue DISCOVERY GATE on multi channels.
  - OLT may choose one channel for discovery and ranging
  - For 50G and 100G PON resilience, if there is fault on the above channel, OLT can choose another channel to issue DISCOVERY GATE and to do ranging.
- OLT can perform ranging on one channel for one ONU, and calculate the other channel's equalization delay due to wavelength difference
- Two methods can be used for channel capability report
  1. During registration process by REGISTER\_REQ MPCPDU
  2. After registration process by eOAM:
    1. Only after OLT obtains all the channels' ranging result of one ONU, the ONU can go to operation state.
    2. This method requires more message exchange between OLT and ONU hence longer registration time

## Straw poll

Which channel capability reporting method is preferred?

- 1) Reporting during registration
- 2) Reporting after registration

# Thank you



Tomorrow never waits

