

# Upstream Burst Delimiter and Sync Pattern Assignment

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- ❑ After review of contributions on upstream burst delimiter selection ([kramer\\_3ca\\_2\\_0118.pdf](#), [effenberger\\_3ca\\_1\\_0118.pdf](#), and [hajduczenia\\_3ca\\_1\\_0118.pdf](#)), agreement that different OLT Rx implementations may need different Sync Pattern (SP) and Start of Burst (SoB) delimiter patterns to optimize burst reception process
- ❑ Irrespective of actual SP and SoB values, as long as sufficient Hamming distance is guaranteed, MTT for false burst lock and burst loss can be guaranteed.
- ❑ OLT announces SP and SoB pattern values to ONUs during initial MPCP Discovery process to be used in the upstream direction. OLT uses default SP/SoB values unless different values are specified by the vendor. ONU always uses SP/SoB values announced by OLT during Discovery window.
- ❑ New MPCP DUs are needed to broadcast SP and SoB pattern values to all ONUs on PON

- ❑ OLT needs to announce SP and SoB values (two independent parameters). Requirement to be added for SP and SoB to guarantee minimum Hamming distance of  $X$  (e.g., 110 for 257-bit SP/SoB patterns)
- ❑ End Of Burst (EoB) uses 3+ 66-bit blocks of all zeros (as it was done in 10G-EPON)
- ❑ Assuming (strawman) agreement to use 256b/257b line code, SoB and SP are 257-bits long each. Assignment mechanism can be the same for shorter SP/SoB if different line code is adopted.
- ❑ New MPCPDUs needed to carry each value separately
  - 257 bits = 33 octets needed. Single MPCPDU has 40-octet payload available (see Figure 144–4 in D0.6)
  - Proposal for two new MPCPDUs presented on the next slides

# Announce SP MPCPDU

- Used to announce the value of Synchronization Pattern (SP) to all ONUs on PON

- Opcode 0x0018 (next available)
- Sync Pattern written into 33-octets wide data field, right adjusted, i.e., bit number 257 is written into rightmost bit in octet 0, followed by next octets of SP, as shown below

Octet	Value (binary)
0	0-0-0-0-0-0-0-SP<256>
1	SP<255:248>
2	SP<247:240>
...	...
32	SP<7:0>

## Announce SP MPCPDU

Destination Address	6
Source Address	6
Length/Type = 0x8808	2
Opcode = 0x0018	2
Timestamp	4
Sync Pattern (SP)	33
Reserved/Pad	7
FCS	4

# Announce SoB MPCPDU

- Used to announce the value of Start of Burst (SoB) to all ONUs on PON
  - Opcode 0x0019 (next available)
  - SoB written into 33-octets wide data field, right adjusted, i.e., bit number 257 is written into rightmost bit in octet 0, followed by next octets of SoB, as shown below

Octet	Value (binary)
0	0-0-0-0-0-0-0-SoB<256>
1	SoB<255:248>
2	SoB<247:240>
...	...
32	SoB<7:0>

## Announce SoB MPCPDU

Destination Address	6
Source Address	6
Length/Type = 0x8808	2
Opcode = 0x0019	2
Timestamp	4
Start of Burst (SoB)	33
Reserved/Pad	7
FCS	4

- ❑ OLT announces SP/SoB MPCPDUs periodically together with (before or after) Discovery GATE MPCPDU. OLT uses vendor-specific or default (standard-defined) SP/SoB values.
- ❑ EoB derived from SoB or set per 10G-EPON EoB pattern.
- ❑ ONU cannot start upstream transmission (respond to Discovery GATE MPCPDU) without SP and SoB values received from the OLT.
- ❑ ONU does not validate SP and SoB values (in any way) received from the OLT. Requirements for minimum Hamming distance between SP and SoB for all possible shift positions.

- ❑ OLT needs to deregister the ONU to change SP and/or SoB values, if they need to be modified for any reason. Unlikely that changes to SP/SoB values on per burst basis are needed.
- ❑ Once registered, ONU stops listening and acting on SP/SoB announcement MPCPDUs.
- ❑ MPCP operation state diagrams not present in D0.6 yet, no updates needed immediately.

- Move to adopt slides 3-7 in hajduczenia\_3ca\_2a\_0118 as baseline for Sync Pattern and Start of Burst announcement in 100G-EPON. No changes to draft at this time.
  
- Moved by: Marek Hajduczenia
- Seconded by: Frank Effenberger
  
- Technical:  $\geq 75\%$
- Y: 27 N: 0 A: 1