

EPoC Broadcast LLID & Discovery

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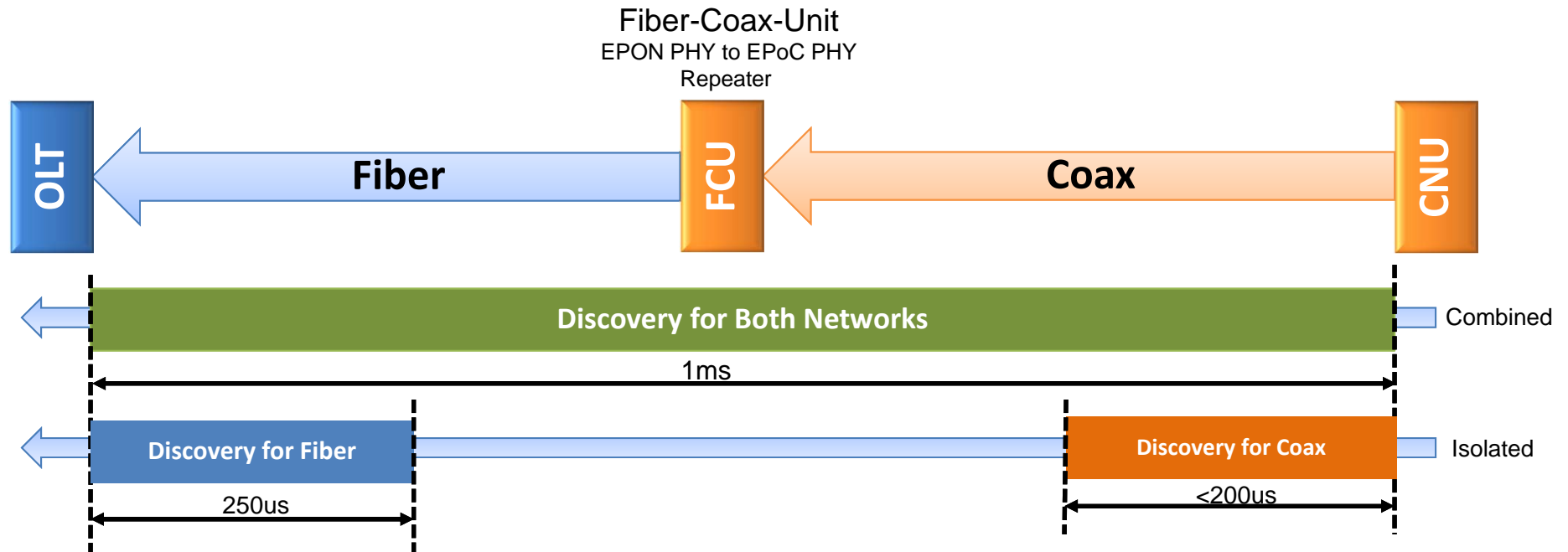
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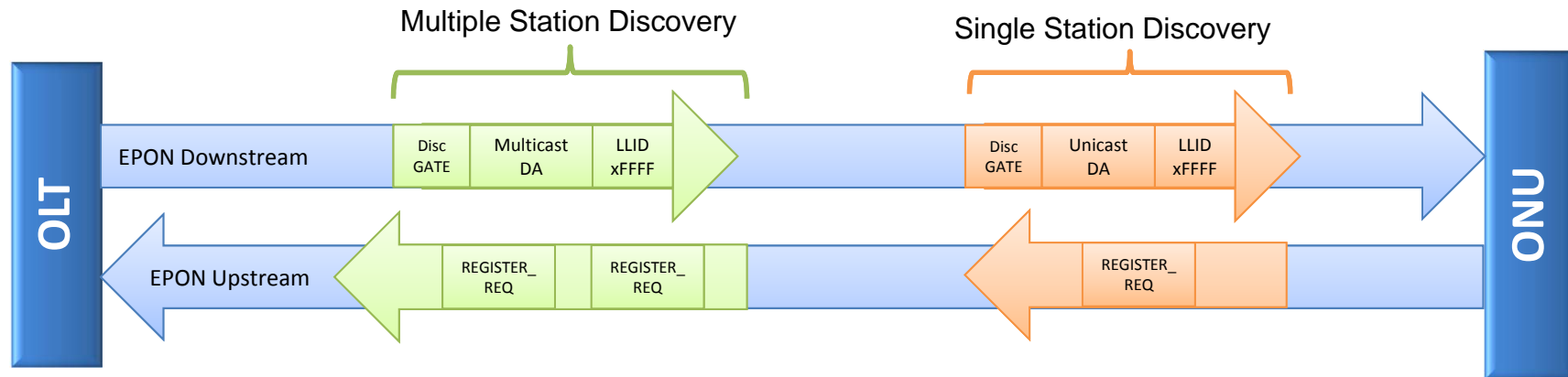
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Isolating Discovery



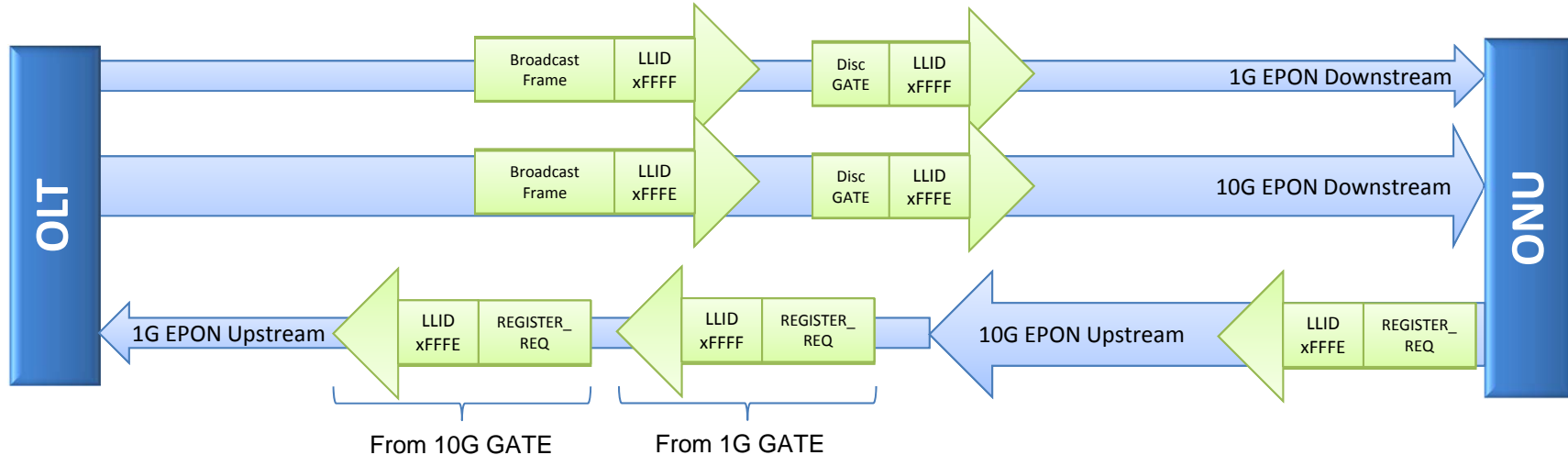
- ONUs and FCUs will have a short RTT delay (<200us) while CNU's will have a long RTT delay (~1ms).
- A single discovery window for ONUs, FCUs, and CNU's will need to match the longest RTT delay (~1ms) so it will be disruptive to upstream scheduling.
- A discovery window sized for ONUs only (fiber network) & CNU's only (coax network) will be less disruptive and conserve upstream bandwidth.
- In 1G-EPON and 10G-EPON, OLT can select discovery windows for 1G, 10G, or both upstreams.
- EPoC requires the same functionality.

EPON Directed Discovery



- EPON allows for Directed Discovery
 - Unicast DA allows for a single ONU to register.
- EPoC should allow for Directed Discovery
 - Directed Discovery is useful if CNU distance and MAC address is known.
 - Registering Links are good for candidates
 - PHY Link Up can provide information for directed discovery.
- Broadcast Discovery is still required
 - Registration of Multiple LLIDs will require it.
 - Broadcast is faster when multiple CNUs register at once.

EPON Review



- EPON specifies 2 LLID values for Broadcast Downstream.
 - 1G downstream uses 0x7FFF
 - 10G downstream uses 0x7FFE
- EPON 1G Upstream REGISTER_REQ LLID (Echo of downstream LLID)
 - Uses 0x7FFE for discovery slot REGISTER_REQ from 10G downstream
 - Uses 0x7FFF for discovery slot REGISTER_REQ from 1G downstream
- EPON 10G Upstream REGISTER_REQ LLID
 - Uses 0x7FFE for discovery slot REGISTER_REQ
- What LLID value should be used for EPoC?
 - 1G value (0x7FFF) wouldn't make sense.
 - 10G value (0x7FFE) or a new value?

What is the Broadcast LLID for EPoC

- A different Broadcast LLID could be used to isolate discovery for EPON and EPoC (0x7FFC?).
- If we assume that EPoC exists as a PHY under the 10G-EPON MAC...
 - The Broadcast LLID should be 0x7FFE for both discovery and broadcast traffic
 - The Discovery GATE frame will contain the discovery information field
 - The Discovery information field allows for isolating discovery

EPON Discovery Information

- Bit 0: OLT is 1G upstream capable
 - 0: OLT does not support 1 Gb/s reception
 - 1: OLT supports 1 Gb/s reception
- Bit 1: OLT is 10G upstream capable
 - 0: OLT does not support 10 Gb/s reception
 - 1: OLT supports 10 Gb/s reception
- Bit 2–3: Reserved (Ignored on reception)
- Bit 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
- Bit 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
- Bits 6–15: Reserved (Ignored on reception)

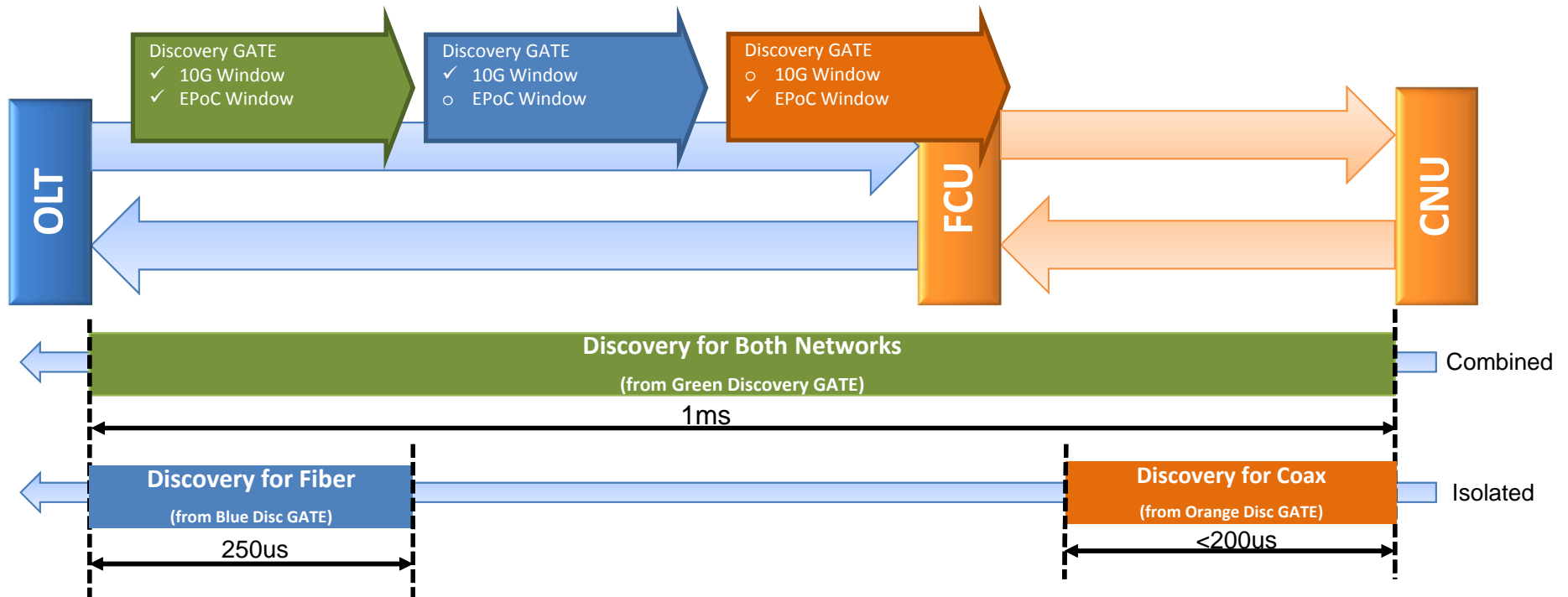
Discovery GATE

Destination Address	6
Source Address	6
Length/Type = 0x8808	2
Opcode = 0x0002	2
Timestamp	4
Number of grants/Flags	1
Grant #1 Start time	4
Grant #1 Length	2
Sync Time	2
Discovery Information	2
Pad/Reserved	29
FCS	4

EPoC Discovery Information

- Reserved Bit 2 could be “OLT is EPoC Capable” .
 - OLT would announce to the CNU/ONUs that it supports EPoC.
 - Is this necessary? No clear need but it could be done for consistency.
- Reserved Bit 6 could be “OLT is opening a EPoC Discovery Window”
 - OLT could select to open a discovery for 1G, 10G, and/or EPoC.
 - This bit allows for the isolated discovery.

Discovery Information Option



- Flexible:
 - Discovery Windows can be combined or isolated based on window selection bits in discovery information field.
- Backwards compatible:
 - Legacy 10G devices will ignore the reserved bit for EPoC and will not respond to discovery if EPON window isn't opened.

Summary

- The EPoC PHY should assume that it is connected to the 10G-EPON Ethernet MAC (XGMII)
- EPoC could use the 10G-EPON broadcast LLID value (0x7FFE).
 - There is no clear reason to assign a new value.
- EPoC should modify the discovery information field.
 - EPoC may decide to define a new bit to announce OLT support for EPoC.
 - EPoC needs to define a new bit to support isolated EPoC discovery windows.

Straw Poll

- The Discovery Information Field Definition should be modified to include EPoC?
- Yes:
- No:
- Abstain: