Outline of work needed to leverage existing clauses for 2.5/5GBASE backplane

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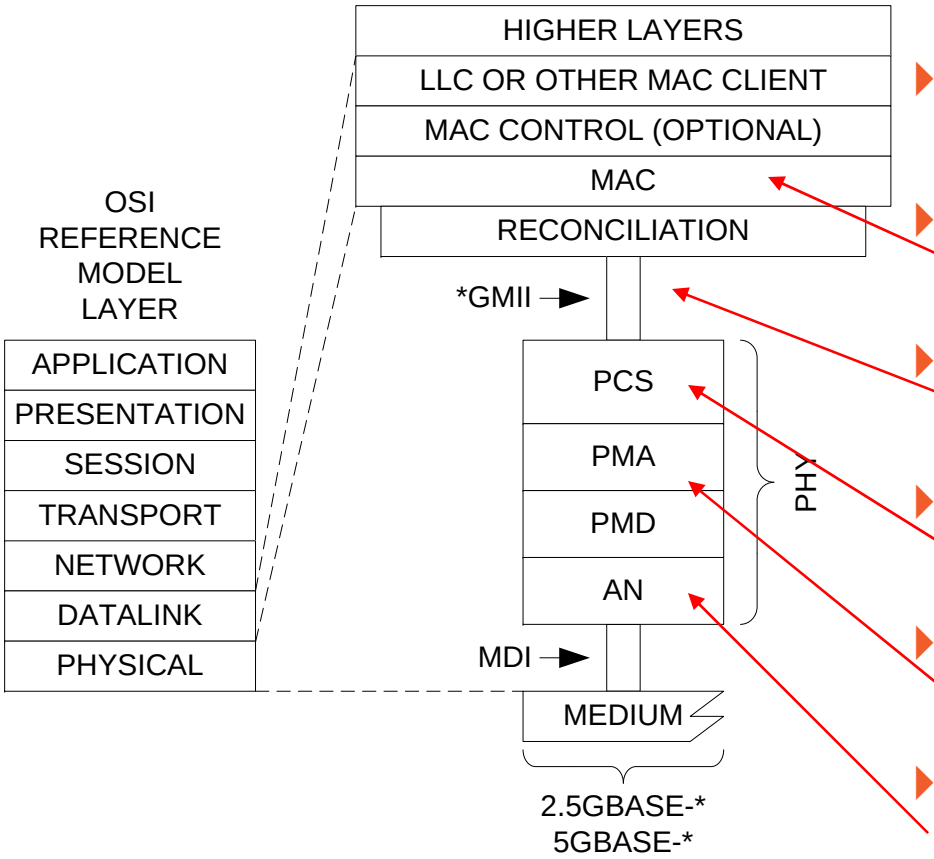
Agenda

- Specify 2.5G and 5G Backplane Ethernet reusing as much of existing 802.3 as possible
- Describe work needed on a high level
  - Not diving into details
  - Not making any technical decisions

Ethernet Reference Model



- **Management (Clause 30)**
  - Add new capabilities
- **Registers (Clause 45)**
  - Add / Modify registers
- **2.5G/5G MAC (Clause 4)**
  - Being handled by 802.3bz Task Force
- ***GMII (Clause 46)**
  - Being handled by 802.3bz Task Force
- **PCS (New)**
  - Either 1 or 2 new clauses
- **PMA/PMD (New)**
  - At least one new clause possibly more
- **Auto-Negotiation (Clause 73)**
  - Add new speed definitions
- **Energy Efficient Ethernet (Clause 78)**
  - Some modifications

Simple Changes

- **Clause 1 - Introduction**
  - Trivial change to add definition to the new backplanes introduced
- **Clause 30 - Management**
  - Trivial addition on new PHY management attributes
- **Clause 125 – Introduction to 2.5 Gb/s and 5 Gb/s networks**
  - Trivial changes to introduce the new backplanes
- **Clause 4 – Media Access Control**
  - New MAC speeds – work already being done by 802.3bz
  - 2.5G and 5G backplane will only support full duplex
- **Clause 46 – Reconciliation Sublayer**
  - Optional digital interface – work already being done by 802.3bz
- **Clause 73 – Auto-Negotiation**
  - Trivial change to add definition to the new backplanes capability

Simple but More Tedious Changes

- **Clause 45 – Management Data Input/Output Interface**
  - **Register Section**
  - **Not hard to specify, but gets messy and tedious working with existing registers**

Physical Coding Sublayer (PCS)

- **Leverage 1000BASE-X (Clause 36)**
  - **Existing implementations running at 2.5G already**
  - **Need minor alterations to attach to XGMII as chosen by 802.3bz**
- **Leverage 10GBASE-R (Clause 49)**
  - **More bandwidth efficient**
  - **Easy to leverage KR training if needed**
- **1000BASE-X a good choice for 2.5G and 10GBASE-R for 5G**

Physical Medium Attachment Sublayer (PMA)

- **2.5G PMA**
  - **Can use Clause 36 – trivial to incorporate**
- **5G PMA**
  - **Can use Clause 51 as starting point**
  - **Can simplify a lot as an exposed PMA interface does not need to be defined**

Physical Medium Dependent Sublayer (PMD)

- **2.5G Backplane Electrical Characteristics**
  - Use Clause 71 PMD 10GBASE-KX4 except one lane instead of four
  - Already 3.125 Gb/s raw rate
- **2.5G Short Reach Copper Electrical Characteristics**
  - Use Clause 54 PMD 10GBASE-CX4 except one lane instead of four
  - Already 3.125 Gb/s raw rate
- **5G Backplane Electrical Characteristics**
  - Can start with Clause 72 PMD 10GBASE-KR
  - Need to change parameters from 10G to 5G
  - KR training can be used as is if included in the standard
  - Good subject of discussion as no raw 5G backplane PMD defined
- **5G Short Reach Copper Electrical Characteristics**
  - Can start with Clause 85 PMD 40GBASE-CR4 except one lane instead of four
  - Need to change parameters from 10G to 5G
  - Good subject of discussion as no raw 5G copper PMD defined

Energy Efficient Ethernet

- **Clause 78 – Energy Efficient Ethernet**
  - Need to specify the timing parameters for the new backplane speeds
  - Optional capability
- **Need to discuss EEE within the new backplane PMD sections**
- **Leverage 1000BASE-KX and 10GBASE-KR as is**
  - May need some timer adjustments, but no change needed in mechanism

THANK YOU