40 Gb/s Ethernet optimized for client applications in the carrier environment: COMPATIBILITY

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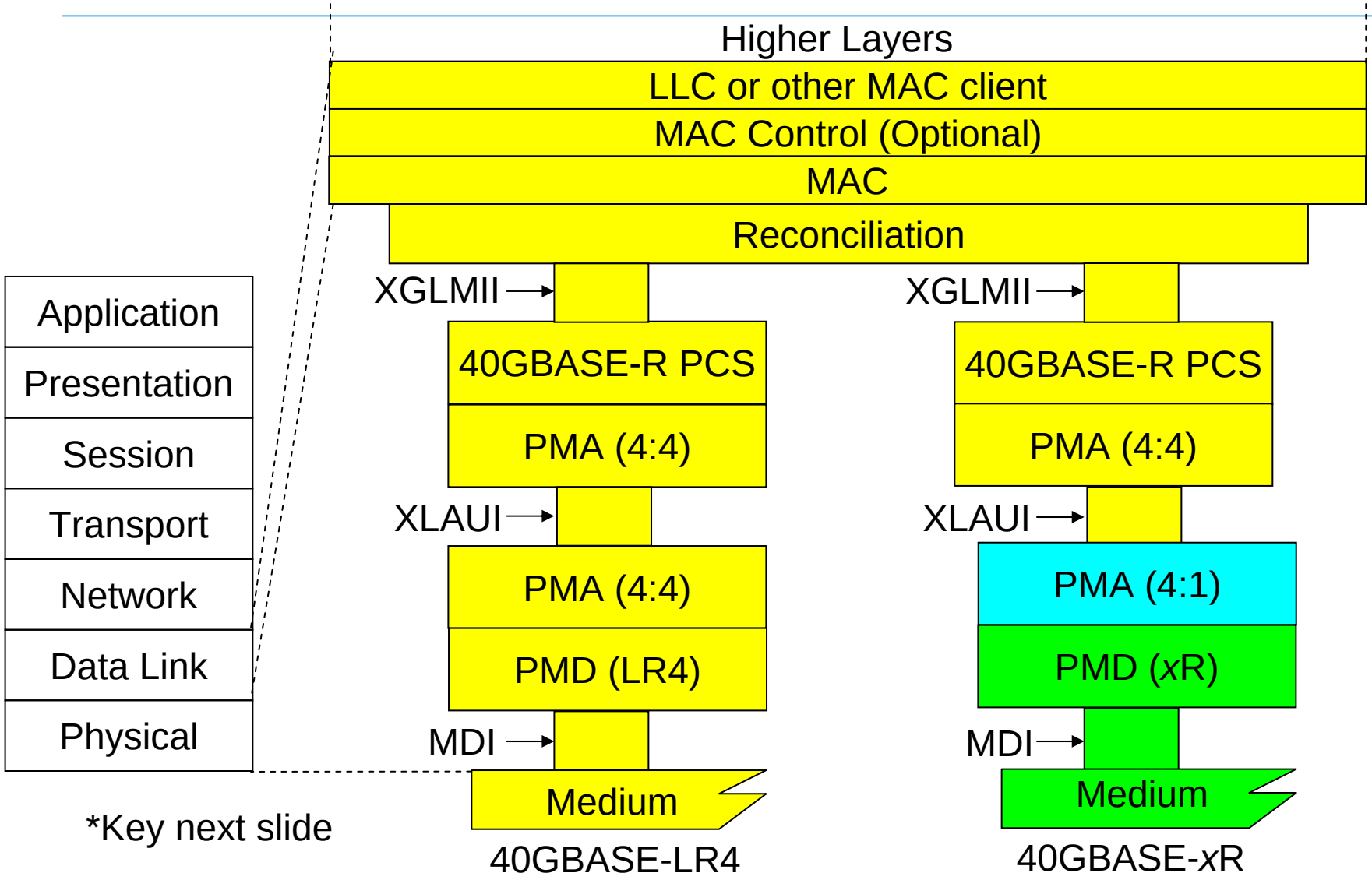
Reuse and compatibility with P802.3ba sub-layers – 40GBASE-LR4 vs. 40GBASE-*x*R



*Key next slide

Key to Architecture Diagram

- Identical Specification and Implementation with P802.3ba 40GBASE-LR4 (clauses 80-82, clause 83 for PMA(4:4)).
- Specification Reuse from P802.3ba. While a 40GBASE-R PMA(4:1) is not required to support any P802.3ba PMD, clause 83 fully specifies how the PMA(4:1) will behave
- New PMD specification required for 40GBASE-*x*R

Management Compatibility
40GBASE-LR4 vs 40GBASE-*x*R

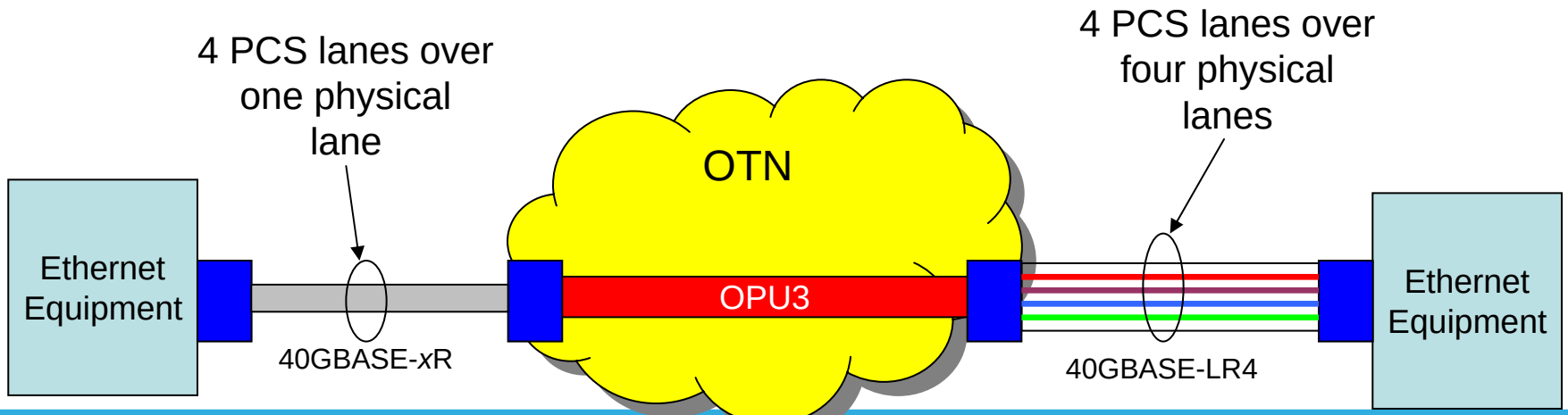
Register/Bit Number (clause 45)	PMD Control/Status Variable
1.0.15	PMD_reset
1.9.0	PMD_global_transmit_disable
1.9.4	PMD_transmit_disable_3
1.9.3	PMD_transmit_disable_2
1.9.2	PMD_transmit_disable_1
1.9.1	PMD_transmit_disable_0
1.1.7	PMD_fault
1.8.11	PMD_transmit_fault
1.8.10	PMD_receive_fault
1.10.0	PMD_global_signal_detect
1.10.4	PMD_signal_detect_3
1.10.3	PMD_signal_detect_2
1.10.2	PMD_signal_detect_1
1.10.1	PMD_signal_detect_0

Not Needed!!!

Not Needed!!!

OTN Support
40GBASE-LR4 vs 40GBASE-*x*R

- The information content (ITU-T term = “characteristic information”) of an 802.3ba signal is comprised of the PCS lanes. The way that those PCS lanes are mapped or sequenced onto physical lanes (as long as within the skew budget) is irrelevant.
- The assurance that 40GBASE-R signals can be mapped with PCS codeword transparency into OPU3 is provided through a well-defined PCS codeword set and accompanying warnings and prohibitions in clause 82. Since 40GBASE-*x*R will use this same PCS, the attributes that assure that it can be mapped into OPU3 will be maintained. Note that the mapping in ITU-T G.709 of 40GBASE-R into OPU3 operates by transcoding the PCS codewords described in clause 82, and does not rely on the relationship between PCS lanes and physical lanes in the Ethernet PMD.
- The following configuration will work due to use of the clause 82 PCS:



Other compatibility aspects

- Additional skew between PCS lanes will not accrue over the serial medium which maintains the bit multiplexing order. Both the total skew and skew variation between SP3 and SP4 will be less for 40GBASE-*x*R than for 40GBASE-LR4. Therefore a PCS which supports the skew budget of 40GBASE-LR4 (subclause 80.5) can tolerate the total skew and skew variation of 40GBASE-*x*R.
- Since serial was a candidate solution considered in the P802.3ba task force, the lane marking and alignment processes, together with the clock content and baseline wander arising from bit multiplexing of four PCSLs have already been analyzed and found to be acceptable: see anslow_06_1108.pdf
- If clause 83B chip-to-module XLAUI is implemented and if the module form factor and electrical interface are the same, the same host board can be used for 40GBASE-LR4 and 40GBASE-*x*R

Compatibility

- **IEEE 802 defines a family of standards. All standards should be in conformance with the IEEE 802.1 Architecture, Management, and Interworking documents as follows: IEEE 802. Overview and Architecture, IEEE 802.1D, IEEE 802.1Q, and parts of IEEE 802.1F. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with IEEE 802.1.**
- **Each standard in the IEEE 802 family of standards shall include a definition of managed objects that are compatible with systems management standards.**
- **Compatibility with IEEE Std 802.3**
- **Conformance with the IEEE Std 802.3 MAC**
- **Managed object definitions compatible with SNMP**
- As a further amendment to IEEE Std 802.3 as amended by the IEEE P802.3ba project, the proposed project will remain in conformance with the IEEE 802 Overview and Architecture, the bridging standards IEEE Std 802.1D and IEEE Std 802.1Q and clause 80 introduced by P802.3ba.
- As an amendment to IEEE 802.3, the proposed project will follow the existing format and structure of IEEE 802.3 MIB definitions by providing a protocol-independent specification of managed objects. The MDIO interface is expected to be a strict subset of what is specified in 802.3ba for 40GBASE-LR4.
- Utilizing the same MAC, PCS, and PMA as 40GBASE-LR4, the new PMD maintains the same relationship to IEEE Std 802.3 as 802.3ba 40 Gb/s PMDs. Using the same PCS as 802.3ba 40Gb/s PMDs allows the same ITU-T G.709 mapping into OPU3 to be used.
- The proposed amendment will conform to the full-duplex operating mode of the IEEE 802.3 MAC.
- The project will include a protocol independent specification of managed objects with SNMP management capability to be provided in the future by an amendment to the yet-to-be-approved IEEE Std 802.3.1.