IEEE 802.3av D0.9
Overview of Clauses 64, 91, 92

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Current Status

- Draft 0.9 of IEEE 802.3av is ready:
  - Clause 64 “Multipoint MAC Control” with editorial changes
  - Clause 91 “Physical Medium Dependent (PMD) sublayer and medium, type 10GBASE-PR10, 10GBASE-PR20 and 10GBASE-PR30 (10 Gbit/s long wavelength passive optical networks)”
  - Clause 92 “Extensions of the Reconciliation Sublayer (RS) and Physical Coding Sublayer (PCS) / Physical Media Attachment (PMA) for 10GBASE-R for multipoint links and forward error correction”

Clause 64 – MPCP [1]

- Overview of alternations:
  - Mainly editorial, related with introduction of motions #3 and # 22 from San Francisco 2007
  - Subclauses affected (apart for Clause 92):
    - 64.1.2 Position of Multipoint MAC Control within the IEEE 802.3 hierarchy
    - 64.3.2.3 Multicast and single copy broadcast support – still requires clarification and extension
    - 64.3.3.6 State Diagram
    - 64.3.6.1 GATE description
    - 64.3.6.3 REGISTER_REQ description
    - 64.3.6.4 REGISTER description

Clause 64 – MPCP [2]

- Overview of alternations:
  - Replaced all references to a single SCB MAC to two instances of SCB MACs
  - Replaced all references to Broadcast LLID with the text “appropriate broadcast LLID(s) ($0x7FFF_{16}$ and/or $0x7FFE_{16}$ for IEEE 802.3ah and IEEE 802.3av compliant ONUs respectively).”
  - 64.3.2.3 Multicast and single copy broadcast support requires further clarification of the LLID mapping mechanism:
    - will be referred to in MPCP DU description via “such frame is marked by the appropriate broadcast LLID ($0x7FFF_{16}$ or $0x7FFE_{16}$, see 64.3.2.3).”

Clause 64 – MPCP [3]

- Required alternations (technical):
  - 64.2.2.3 Variables
    - Description of the FEC_Overhead(length) variable will need an ovehaul to include the details on the 10G FEC if adopted
- Required alternations (editorial):
  - 64.3.6.1 GATE description
    - Pad/reserved field description should constitute item f) following the general MPCP DU description:

      e) Sync Time. This is an unsigned 16 bit value signifying the required synchronization time (…) Discovery flag and is not present otherwise.

      f) Pad/Reserved. This is an empty field that is transmitted as zeros (…) ONUs and such frame is marked ….

Clause 91 – 10 Gbit/s PMD [1]

- Clause Structure:
  - 91.1 Overview:
    - definitions & terminology (91.1.3)
    - PMD objectives (91.1.1) & positioning in the 802.3 stack architecture (91.1.2)
    - PMD sublayer service interface (91.1.4)
    - Delay constraints (91.1.5)
  - 91.2 PMD Functional specifications
    - PMD block diagram (91.2.1) - to be discussed
    - PMD Tx (91.2.2) and Rx (91.2.3) functions
    - PMD Signal Detect function (91.2.4)

Clause 91 – 10 Gbit/s PMD [2]

- Clause Structure:
  - 91.3 10GBASE-PR10 PMD:
    - Transmitter optical specifications (91.3.1) – parameters TBD
    - Receiver optical specifications (91.3.2) – parameters TBD
  - 91.4 10GBASE-PR20 PMD:
    - Transmitter optical specifications (91.4.1) – parameters TBD
    - Receiver optical specifications (91.4.2) – parameters TBD
  - 91.5 10GBASE-PR30 PMD:
    - Transmitter optical specifications (91.5.1) – parameters TBD
    - Receiver optical specifications (91.5.2) – parameters TBD
  - 91.6 Illustrative channels and penalties
    - Parameter values to be verified and discussed

Clause 91 – 10 Gbit/s PMD [3]

- Clause Structure:
  - 91.7 Jitter at TP1-4:
    - Currently a copy from Clause 60 is inserted – the text requires rewriting when PMD block diagram (91.2.1) is defined
  - 91.8 Optical measurement requirements
    - To be rewritten apart from 91.8.13.2 “Receiver settling timing measurement”
  - 91.9 Environmental, safety, and labeling
    - Confirmation and editorial changes may be needed – a copy-paste from Clause 60 is used tentatively with alignment to 3 PMDs

Clause 91 – 10 Gbit/s PMD [4]

- Clause Structure:
  - 91.10 Characteristics of the fiber optic cabling:
    - Confirmation and editorial changes may be needed – a copy-paste from Clause 60 is used tentatively with alignment to 3 PMDs
  - 91.11 Protocol implementation conformance statement (PICS)
    - Confirmation and editorial changes may be needed – a copy-paste from Clause 60 is used tentatively with alignment to 3 PMDs

Clause 92 – 10 Gbit/s PMA, PCS and RS [1]

- Clause Structure:
  - 92.1 Extensions to RS:
    - Overview (92.1.1), principle of operation (92.1.2) and functional specifications (92.1.3) with XGMII Structure (92.1.3.1) and primitive mapping
    - Most of this subsection can be cross-referenced with Clause 65 (for 1GEPON) and 46 (10GE)
    - A new subclause structure may be required to align with the Clause 46 format – to be decided by the TF
    - CRS signal generation description, state machine and conditions were added to the standard XGMII text

Clause 92 – 10 Gbit/s PMA, PCS and RS [2]

- Clause Structure:
  - 92.2 Extensions to PCS
    - Overview (92.2.1), Burst-mode operation (92.2.2), where both DS and US PCS operation blocks are depicted. Laser control and Synchronization process details are also included.
    - This clause will supersede Clause 65, allowing for dual rate operation with two MII interfaces (GMII and XGMII)
    - Figure 92-3 may require alignment with Clause 91
    - XGMII code word alignment process is described following the appropriate TF motions. State machines and Figures were added. Text needs to be verified and cross-checked by the TF.

Clause 92 – 10 Gbit/s PMA, PCS and RS [3]

- Clause Structure:
  - FEC (92.2.3)
    - describes the current state of the FEC mechanism for 10G EPONs with implementation of relevant motions from Orlando, Geneva, and San Francisco. Placement of parity words as well as frame format is already included.
    - implements both Tx and Rx path description (including description and state machines)
    - large blocks of text need still to be updated to meet the specification of the 10GEPON –more TF motions are required to have this subclause completed

Clause 92 – 10 Gbit/s PMA, PCS and RS [4]

- Clause Structure:
  - 91.3 Extensions to PMA
    - Extensions for XEPON_PMD-U (92.3.1)
    - Extensions for XEPON_PMD-D (92.3.2)
  - 91.4 Protocol implementation conformance statement (PICS)
    - Confirmation and editorial changes may be needed – a copy-paste from Clause 65 is used tentatively with alignment to 10G EPON layers