P2MP Clauses Satisfy PAR

- **Title:** Clauses 64 - 65 define a Point-to-Multipoint MAC Control Sublayer and Reconciliation Sublayer

- **Scope:** Clauses 64 - 65 operate at 1000 Mbps - within the scope of the current standard

- **Purpose:** Clauses 64-65 P2MP expand the Ethernet application space to include economical point-to-multipoint fiber access networks that provide a significant increase in performance while minimizing equipment, operation, and maintenance costs.

P2MP Clauses Satisfy 5 Criteria

Broad Market Potential

- **Broad applicability:**

  Applicable for FTTH (home), FTTB (business), FTTMDU (building) and FTTC (curb). Supports broadband, multiple services: Voice, Video, Data

- **Multiple Vendors:**

  >70 Vendors participating in P2MP

- **Multiple Users:**

  >12 ILEC/PTT supporting P2MP efforts
  >20 CLEC/IOC P2MP fiber deployments announced

P2MP Clauses Satisfy 5 Criteria

Broad Market Potential

- **Significant market size**:
  Potential demand is 10's of millions of CPE units. Current market research reports: multi-billion dollar world-wide market potential.
- **Balanced cost (LAN vs. attached stations):**
  - Optimal balance is achieved by enabling a point-to-multipoint optical infrastructure that does not require active nodes in the field and minimizes number of transceivers and fiber deployment.
  - P2MP reduces equipment cost by sharing a single CO port among multiple CPEs

P2MP Clauses Satisfy 5 Criteria

Compatibility

- **Conformance with 802 Overview and Architecture:**
  Point-to-Multipoint conforms to the 802 Overview and Architecture, including the peer-to-peer key concept
- **Conformance with 802.1D, 802.1Q, 802.1f:**
  P2MP is conformant with 802 Reference Model. Point-to-Point Emulation (in C65) ensures 802.1D compatibility. Preserves MAC, Frame Format, Line Code, and GMII.
- **Compatible managed objects definitions:**
  Follows the existing format and structure of 802.3 MIB definitions.

P2MP Clauses Satisfy 5 Criteria

Distinct Identity

- **Substantially different from other 802 standards:**
  Yes, there is no 802 standard for optical point-to-multipoint for subscriber access networks
- **One unique solution per problem:**
  Yes, MPCP protocol controls multi-point operation for various deployment scenarios, configurations, and provisioning algorithms.
- **Easy for the reader to select the relevant specification:**
  Yes, Clause 64 defines Point-to-Multipoint Ethernet architecture and specifies Multi-Point Control Protocol. Clause 65 defines Point-to-Point Emulation and Forward Error Correction.

P2MP Clauses Satisfy 5 Criteria

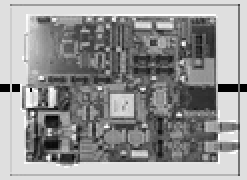
Technical Feasibility

Demonstrated system feasibility:

- P2MP systems and algorithms were extensively simulated and analyzed
- Proofs-of-concept were shown
- Systems and components were demonstrated by multiple vendors

Optical Line Terminals

Optical Networks Units



Design Kits

Chipsets

Optical Transceivers

P2MP Clauses Satisfy 5 Criteria

Technical Feasibility

- **Proven technology, reasonable testing:**
  P2MP systems were demonstrated to perform reliably. P2MP has been tested in both simulation and implementation.

- **Confidence in reliability:**
  P2MP, using a robust low complexity protocol in the MAC Control Sublayer, builds upon the reliability of Ethernet components and systems.

P2MP Clauses Satisfy 5 Criteria

Economic Feasibility

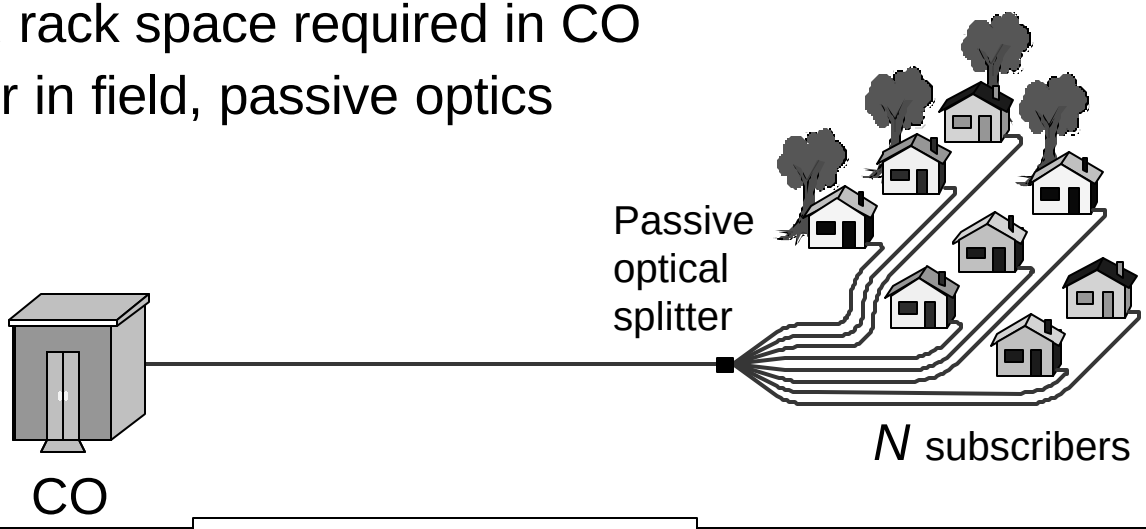
- **Known cost factors, reliable data:**
  Well-known Ethernet component cost factors and relaxed specification parameters ensure low cost of components and systems

- **Reasonable cost for performance:**
  P2MP achieves high performance by providing symmetrical 1000 Mbps upstream and downstream bandwidth that can be flexibly divided amongst CPEs. Cost of operation is reduced by relying on ubiquitous Ethernet components, minimal infrastructure cost, and elimination of active (managed) devices in the field, resulting in a low cost/performance ratio.

P2MP Clauses Satisfy 5 Criteria

Economic Feasibility

- **Consideration of installation costs:**
  P2MP architectures have lower installation cost due to
  - Minimal number of trunk fibers to deploy and manage
  - Minimal number of transceivers (N+1 transceivers for N users)
  - Reduced rack space required in CO
  - No power in field, passive optics



P2MP Clauses Satisfy Objectives

Support subscriber access network topologies:

Point-to-Multipoint on Optical Fiber

Clause 64 Multipoint MAC Control

Clause 65 Reconciliation

Provide a family of physical layer specifications:

PHY for PON, >= 10km, 1000Mbps, single SM fiber, >= 1:16

Clause 60 1000BASE-PX10

PHY for PON, >= 20km, 1000Mbps, single SM fiber, >= 1:16

Clause 60 1000BASE-PX20

P2MP is ready for Working Group Ballot !