IEEE 802.3 Closing Plenary Report

IEEE 802.3 Gigabit Ethernet over Plastic Optical Fiber Study Group

Robert M. Grow

GEPOF Study Group Chair

San Antonio, TX, USA

5 November 2014

Reflector and web

- To subscribe to the GEPOF reflector, send an email to:
    ListServ@ieee.org
  with the following in the body of the message (do not include "<>"):
    ***subscribe* stds-802-3-GEPOF** *<yourfirstname>*
        <yourlastname>
    end

- Send GEPOF reflector messages to:
    stds-802-3-GEPOF@listserv.ieee.org

- Study Group web page URL:
    http://www.ieee802.org/3/GEPOFSG/index.html

Activity this week

- Monday tutorial
- 1.5 day meeting, 21 attendees
- 8 presentations on market requirements, complexity, technology and testing for GEPOF
- Responded to comments on PAR and CSD from 802.11
- Worked on channel model
- Future plans discussion

Motions

- Administrivia (agenda, minutes, etc.)
- PAR, CSD, and Objectives motions were passed in May with July and Sept modifications.
- Approved responses to 802.11 comments
- Approved modification to CSD
- Approved modification to PAR
- Request extension of SG

Status

- The p802.3bv PAR and CSD were submitted but withdrawn from EC consideration during the July plenary meeting week.

- The PAR and CSD submitted for November consideration was largely the same as previously submitted, with change marks from the July submittal.

- November comments were received
  - The PAR 5.6, 7.1 and 8.1 were changed in response to comments by 802.11. These changes also satisfied EC comments. Current change marks are for November meeting week changes only.
  - The current CSD also is change marked only for changes made during the November meeting week in response to 802.11 comment.

802.3 approved Objectives

- Preserve the IEEE 802.3/Ethernet frame format utilizing the IEEE 802.3 MAC
- Preserve minimum and maximum frame size of the current IEEE 802.3 standard
- Support full duplex operation only
- Support a data rate of 1000 Mb/s at the MAC/PLS service interface
- For the automotive environment:
  – Specify operation over at least 15m of POF with 4 POF connections
  – Specify operation over at least 40m of POF with no POF connections
- For the home and industrial environment specify operation over at least 50m of POF with 1 POF connections
- Maintain a bit error ratio (BER) better than or equal to 10^{-12} at the MAC/PLS service interface
- Specify optional Energy-Efficient Ethernet for 1000 Mb/s over POF

[Strikethrough objectives were amended.}

Managed Objects

Describe the plan for developing a definition of managed objects. The plan shall specify one of the following:
   a) **The definitions will be part of this project.**
   b) **The definitions will be part of a different project and provide the plan for that project or anticipated future project.**
   c) **The definitions will not be developed and explain why such definitions are not needed.**

- The definition of protocol independent managed objects and/or extension of existing managed objects will be part of this project.

- In addition it is expected that the definition and/or extension of SNMP managed objects, through reference to the protocol independent managed objects provided by this project, will be added in a future amendment to, or revision of, IEEE Std 802.3.1 IEEE Standard for Management Information Base (MIB) Definitions for Ethernet.

Broad Market Potential

Each proposed IEEE 802 LMSC standard shall have broad market potential. At a minimum, address the following areas:
  a) Broad sets of applicability.
  b) Multiple vendors and numerous users.
  c) Balanced Costs (LAN versus attached stations) [Removed from IEEE 802 5 Criteria Nov 2012]

- IEEE 802.3 specifications for Gigabit Ethernet operation over plastic optical fiber has broad support from industry, representing multiple market applications. This includes application in home and small office networking, automotive, industrial, medical and other market segments where harsh environmental requirements exist and/or use of long link lengths is not required.

- Study group presentations and participation reflects the breadth of this support and includes service providers, users, component, and system manufacturers from networking, industrial, automotive and other markets.

- As a PHY project, no significant change to the existing balance of costs between LAN and stations is anticipated.

- It is anticipated that there will be sufficient participation to effectively complete a standards project.

Motion 1 – Broad Market Potential

Move to approve the Broad Market Potential response of the Criteria for Standards Development (CSD) of 1107_gepof_close_report.pdf

Technical (>=75%)

Moved: Bob Grow

Second: from SG

Compatibility

Each proposed IEEE 802 LMSC standard should be in conformance with IEEE Std 802, IEEE 802.1AC, and IEEE 802.1Q. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with IEEE 802.1 WG prior to submitting a PAR to the Sponsor.

    a) Will the proposed standard comply with IEEE Std 802, IEEE Std 802.1AC and IEEE Std 802.1Q?
    b) If the answer to a) is "no", supply the response from the IEEE 802.1 WG.
    c) Compatibility with IEEE Std 802.3
    d) Conformance with the IEEE Std 802.3 MAC
    e) Managed object definitions compatible with SNMP (see Managed Objects)

- As an amendment to IEEE Std 802.3, the proposed project shall comply with IEEE Std 802, IEEE Std 802.1AC and IEEE Std 802.1Q.

- The proposed project will utilize existing IEEE Std 802.3 compatibility interfaces and an architecture consistent with existing Ethernet PHYs.

- The proposed project will conform to the full-duplex operating mode of the IEEE 802.3 MAC.

- As a new PHY, most, if not all, management capability will be additions (e.g., new enumeration(s)) to existing managed objects. If any new objects are required, they will be compatible with SNMP management.

Motion 2 – Compatibility

Move to approve the Compatibility response of the Criteria for Standards Development (CSD) of 1107_gepof_close_report.pdf

Technical (>=75%)

Moved: Bob Grow

Second: from SG

Distinct Identity

Each proposed IEEE 802 LMSC standard shall provide evidence of a distinct identity. Identify standards and standards projects with similar scopes and for each one describe why the proposed project is substantially different.

Substantially different from other IEEE 802.3 specifications / solutions.

- The proposed amendment will be the first IEEE 802.3 PHY for use of plastic optical fiber (POF) as the medium.

- There are ~~standardized~~ specifications for data transmission over POF (VDE V 0885-763, withdrawn ~~at request of IEEE~~). The project will be able to consider leveraging those specifications in adding IEEE Std 802.3 specifications for such transmission.

Motion 3 – Distinct Identity

Move to approve the Distinct Identity response of the Criteria for Standards Development (CSD) of 1107_gepof_close_report.pdf (as amended by the GEPOF study group in response to comments)

Technical (>=75%)

Moved: Bob Grow

Second: from SG

Technical Feasibility

Each proposed IEEE 802 LMSC standard shall provide evidence that the project is technically feasible within the time frame of the project. At a minimum, address the following items to demonstrate technical feasibility:
   a) Demonstrated system feasibility.
   b) Proven similar technology via testing, modeling, simulation, etc.
   c) Confidence in reliability. [Removed from IEEE 802 CSD Nov 2013]

- Technical feasibility is demonstrated by products providing Gigabit Ethernet compatible operation over plastic optical fiber (POF).

- Presentations to the study group reinforce the technical feasibility of Gigabit data communication over POF.

- The bandwidth and attenuation characteristics of POF and the characteristics of optical transmission elements are well understood and can be integrated into a channel model for 802.3 specifications.

- The reliable use of POF cabling and optical components in harsh environments (e.g., industrial and automotive) is well established.

Motion 4 – Technical Feasibility

Move to approve the Technical Feasibility response of the Criteria for Standards Development (CSD) of 1107_gepof_close_report.pdf

Technical (>=75%)

Moved: Bob Grow

Second: from SG

Economic Feasibility

Each proposed IEEE 802 LMSC standard shall provide evidence of economic feasibility. Demonstrate, as far as can reasonably be estimated, the economic feasibility of the proposed project for its intended applications. Among the areas that may be addressed in the cost for performance analysis are the following:

    a) **Balanced costs (infrastructure versus attached stations).**
    b) **Known cost factors.**
    c) **Consideration of installation costs.**
    d) **Consideration of operational costs (e.g. energy consumption).**
    e) **Other areas, as appropriate.**

- A plastic optical fiber (POF) PHY is not expected to significantly change the balance between infrastructure and stations. POF network technology allows more connectivity options and flexible architecture for networks, with very low infrastructure cost.

- Costs of transmitters and receivers, supporting logic and medium are well understood.

- POF provides significant installation advantages compared to glass optical fiber, both for termination of fiber and the minimal training required of installers.

- The project will specify optional Energy Efficient Ethernet capability to reduced energy consumption.

Motion 5 – Economic Feasibility

Moved to approve the Economic Feasibility response of the Criteria for Standards Development (CSD) of 1107_gepof_close_report.pdf

Technical (>=75%)

Moved: Bob Grow

Second: from SG

Draft PAR

http://www.ieee802.org/3/GEPOFSG/
P802_3bv_PAR_051114.pdf

Motion 6 – PAR

Move that 802.3 approve the IEEE P802.3bv Project Authorization Request (P802.3bv_PAR_051114.pdf as amended by the GEPOF Study Group in response to comments).

Technical (>=75%)

Moved: Bob Grow

Second: from SG

Motion 7 – Study Group extension

Move that 802.3 approve a second extension of the GEPOF Study Group.

By rule >50%

Moved: Bob Grow

Second: from SG

Thank You!