OMEGA

Objectives justification

IEEE 802.3 OMEGA SG: 28th April 2020 Telco

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Objectives justification

- The intention of this PPT is to agree on group objectives
  - Speeds
  - Lengths and inline connectors
  - Asymmetry - EEE

- A motion will be presented after this presentation

Requirements from OEMs

Please see cpardo_OMEGA_01_0320.pdf

	2.5 Gbps	5 Gbps	10 Gbps	25 Gbps	50 Gbps	Asymmetric
Backbone	✓	✓	✓	✓	✓	
Smart Antenna	✓					
Cameras, Sensors	✓	✓	✓	✓		✓
Display	✓	✓				✓
Data Loggers		✓	✓	✓	✓	

Too many speeds ?

- It is required by OEMs
- 2.5, 5 and 10 Gb/s are subsets of 25 Gb/s
- Real effort during task force will be 25 and 50 Gb/s
- Same media for all speeds is a strong requirement from OEMs:
  - Developing all the speeds at once, will facilitate the task
- Lower speeds are needed:
  - To reduce power (2.5 Gb/s to 25 Gb/s almost 5 to10 times less power)
  - To reduce Host / MAC requirements in the interface with PHY when data rates are low

Lengths and inline connectors

- 15 m is enough for Cars
- 40 m will address Buses and Trucks
- 4 inline connectors is enough for all applications
- 2 inline connectors might be enough for most of the applications

- Single lane is the preferred solution

Inline connectors

- Between 2 and 4 is the main message
- We should have 4 as an objective if possible
- For 50 Gb/s, 4 might be too aggressive at this time
- SUGGESTION: Set 4 inline for all speeds, but 2 inline for 50 Gb/s
  - If achievable move to 4 inline at 50 Gb/s later in the task-force

Lengths

- At least 15 m is needed for automotive industry
- 40 m will enhance broad market potential:
  - Buses, trucks, trains, planes, …
- For 50 Gb/s, 40 meters might be too aggressive at this time
- SUGGESTION: 15m & 40 m for all the data rates, but only 15 m for 50 Gb/s

ASYMMETRY

- Asymmetric operation should be guaranteed
  - EEE might be the best way to implement it

IEEE 802.3 Optical Multi Gig Ethernet for Automotive Study Group

April 2020
Objectives

Objectives OMEGA

1. Preserve the IEEE 802.3/Ethernet frame format at the MAC client service interface
2. Preserve minimum and maximum frame size of the current IEEE 802.3 standard
3. Support full duplex operation only
4. Define optional startup procedure which enables the time from power_on=FALSE to a state capable of transmitting and receiving valid data to be less than 100ms
5. Support data rates of 2.5 Gb/s, 5 Gb/s, 10 Gb/s, 25 Gb/s, and 50 Gb/s at the MAC/PLS service interface
6. Support optional Energy Efficient Ethernet optimized for automotive application
7. Support operation in automotive environments (e.g., EMC, temperature)
8. Do not preclude meeting FCC and CISPR EMC requirements

Objectives OMEGA

9. Define the performance characteristics of an automotive link segment and an optical PHY to support 2.5 Gb/s point-to-point operation over this link segment supporting up to 4 inline connectors for at least 40 m on at least one type of automotive optical cabling.

10. Define the performance characteristics of an automotive link segment and an optical PHY to support 5 Gb/s point-to-point operation over this link segment supporting up to 4 inline connectors for at least 40 m on at least one type of automotive optical cabling.

11. Define the performance characteristics of an automotive link segment and an optical PHY to support 10 Gb/s point-to-point operation over this link segment supporting up to 4 inline connectors for at least 40 m on at least one type of automotive optical cabling.

12. Define the performance characteristics of an automotive link segment and an optical PHY to support 25 Gb/s point-to-point operation over this link segment supporting up to 4 inline connectors for at least 40 m on at least one type of automotive optical cabling.

13. Define the performance characteristics of an automotive link segment and an optical PHY to support 50 Gb/s point-to-point operation over this link segment supporting up to 2 inline connectors for at least 15 m on at least one type of automotive optical cabling.

14. Support a Bit Error Ratio better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent)

Supporters

- Doarte Gonçalves - PSA
- Magnus Eek - Volvo Cars
- Zhang Tao —SAIC MOTOR Passenger Vehicle Co.
- Hideki Goto - TMC
- Takashi Yasuda - TMC
- Takumi Nomura - Honda R&D

- Steven Swanson - Corning
- Mabud Choudhury - OFS
- Eric Zhangxingxin - Huawei
- Carlos Pardo - KDPOF
- Rubén Pérez-Aranda - KDPOF

Motion

- Adopt the objectives of the OMEGA SG as defined in cpardo_OMEGA_01_280420_Objectives.pdf, slides (#10-#12)

- Mover: Carlos Pardo
- Second: Steven Swanson

- Y: N: A: