Reduced Twisted Pair Gigabit Ethernet SG link segments

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Purpose

- **Discussion of link segment characteristics for "Reduced Twisted Pair Gigabit Ethernet"**

Agenda

- Review presentation – definition update
- UNH-IOL channel evaluation/definitions process
- Survey responses – Next weeks meeting with survey cover letters returned…

Objectives 28-Sept-2012

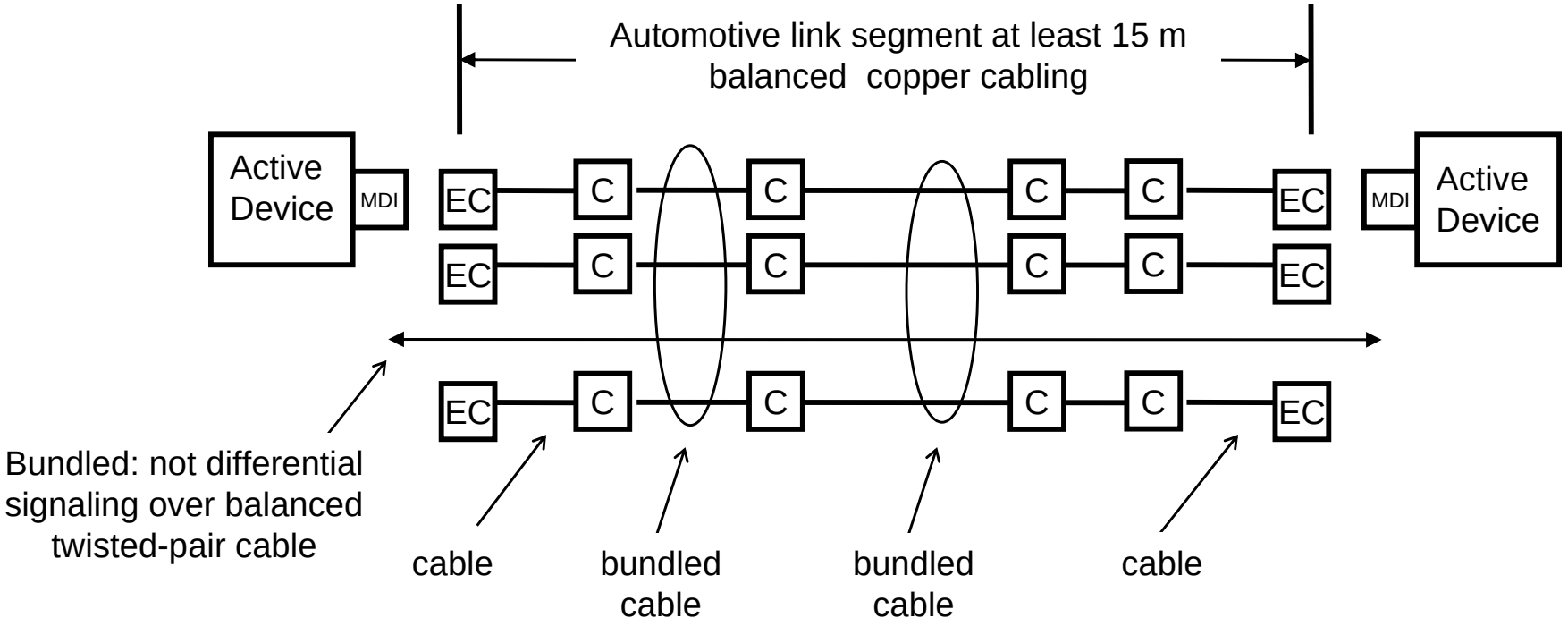
• Define the performance characteristics of an automotive link segment and a PHY to support point-to-point operation over this link segment with less than three twisted pairs supporting up to four inline connectors using balanced copper cabling for at least 15m for the automotive link segment.

• Define the performance characteristics of optional link segment(s) for the above PHY for industrial controls and/or automation, transportation (aircraft, railway, bus and heavy trucks) applications with a goal of at least 40m reach

• Define optional startup procedure which enables the time from power_on=FALSE to valid data to be less than 100ms

http://www.ieee802.org/3/RTPGE/Objectives_0912.pdf

Automotive link segment



The IEEE 802.3 nomenclature is bracketed to identify relationship to the IEEE 802.3 definitions.

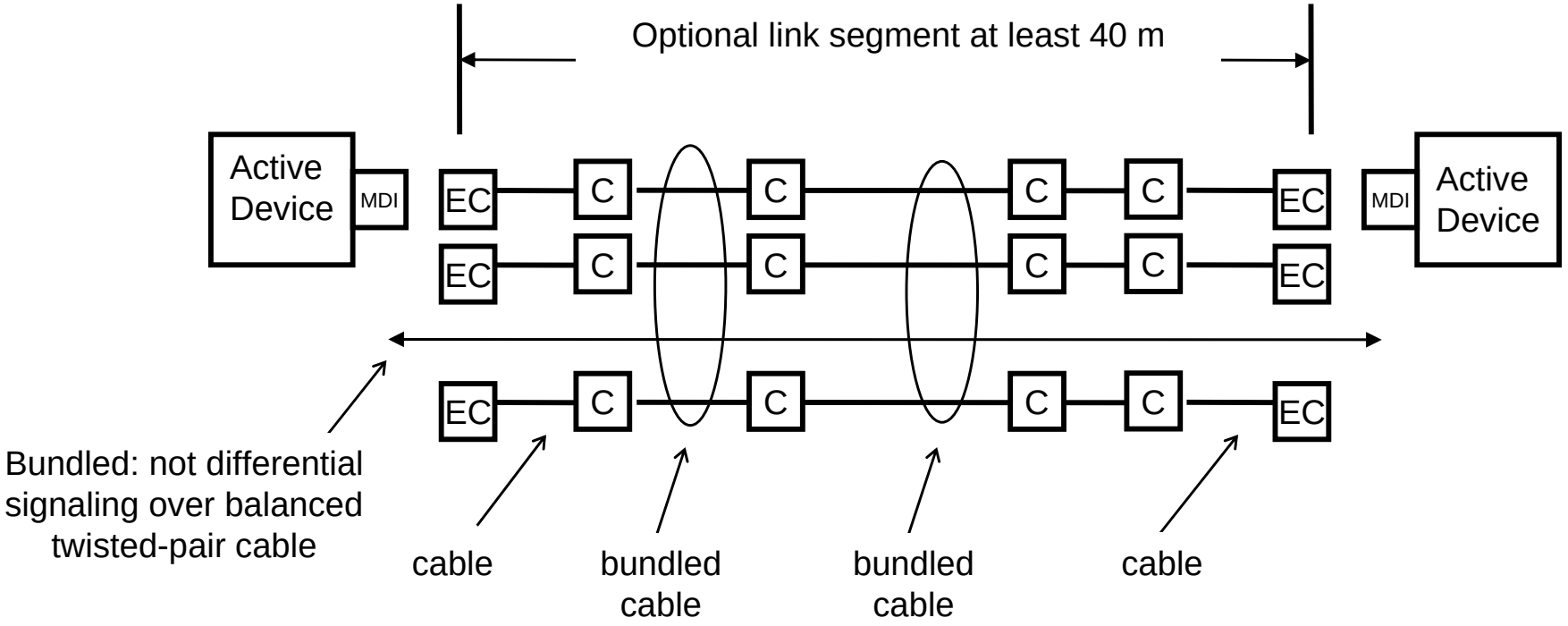
Length objective [EC] to [EC] at least15 m
Number of inline connectors [C] = 4

C = inline connector

EC = connection to equipment

MDI = Active electronics connector [Medium dependent interface (MDI)]

Optional link segment



Length objective [EC] to [EC] at least 40 m
Number of inline connectors [C] = [TBD]

C = inline connector

EC = connection to equipment

MDI = Medium dependent interface (MDI)
[Active electronics connector]

Specifying automotive/optional link segments

- Transmission and coupling parameters
  - Insertion loss
  - Link segment noise
    - o Noise within link segment –
      - ✓ return loss
      - ✓ mode conversion (balance)
      - ✓ For link segments > 1 pair - NEXT, FEXT and multiple disturber
    - o Noise coupling between link segments
      - ✓ Alien crosstalk - ANEXT, AFEXT and multiple disturber ANEXT and AFEXT
    - o Mode conversion (balance)

Specifying automotive/optional link segments

EMC ad hoc

- RTP PHY electromagnetic environment
  - Susceptibility levels
    - o Sources of interference from the environment (TBD)…
      - ✓ External noise - noise from signaling or power in adjacent wire pairs from non-RTP-PHYs
  - Emission levels
    - oThe balanced copper cabling link segment shall comply with applicable local and national codes for the limitation of electromagnetic.

MDI

- .RTP PHY MDI specifications
  - MDI electrical specifications (TBD)
  - Mechanical interface (non-objective)

Specifying automotive/optional link segments

- Signal

  - o Insertion loss – at least 15 m, at least 40 m

- Link segment noise

  - o Noise within link segment –
    - ✓ return loss
    - ✓ mode conversion (balance)
    - ✓ For link segments > 1 pair - NEXT, FEXT and multiple disturber
  - o Noise coupling between link segments
    - ✓ Alien crosstalk - ANEXT, AFEXT and multiple disturber ANEXT and AFEXT
  - o Mode conversion (balance)

Specifying automotive/optional link segments

Link segment SNR

- Insertion loss – at least 15 m, at least 40 m

- Link segment noise
  - o Noise within link segment
  - o Noise coupling between link segments

- External noise - Sources of interference from the environment
  - o e.g., noise from signaling or power in adjacent wire pairs from non-RTP-PHYs