PAM6 considerations

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Introduction

- This contribution lists a set of considerations for developing a complete baseline for electrical interfaces using PAM6 modulation.
- Although similar work is required for PAM4, this contributions points out areas that might need incrementally more work.

Straw poll result(s)

- Straw poll at September interim indicated significant support for PAM6 electrical interfaces
- Likely at least one electrical interface will be defined using PAM6.
- Might include KR, CR, C2M, C2C.

Straw Polls #8 & 9: Electrical Modulation

I believe PAM6 electrical interface(s) should be standardized in IEEE P802.3dv. Y/N/NMI

I believe PAM4 electrical interface(s) should be standardized in IEEE P802.3dv. Y/N/NMI

Results:
SP8 (PAM6) – Y: 54 N: 17 NMI: 20
SP9 (PAM4) – Y: 85 N: 1 NMI: 6

Specifications that might need adaptation for PAM6

- Test patterns
  - New patterns based on current PAM4 patterns? Unique new patterns?
- PAM6 encoding
  - Mapping RS-FEC symbols to PAM6 symbols
  - Error correction or other redundancy coding
- Transmitter and receiver test methods
  - Adapt PAM4 methods, e.g., test pattern transitions for jitter measurements
  - Newly determined limits for measured parameters.
  - Unique PAM6 parameters/methods?
- COM and ERL algorithms
  - Adapt PAM4 algorithms. Likely just new parameter sets.
  - Unique PAM6 algorithms?
- APSU, esp. ILT
  - training frame format
    - adapt control and status fields
    - new training pattern(s)
  - state diagrams, including related text, variables, etc., updates?

Analysis required

- Trade off between PAM6 coding techniques
  - net coding gain
  - complexity, power
- Effect of conventional patterns after PAM6 modulation
- Effect of PCS alignment markers after PAM6 modulation
- Error correlation and need for enhanced RS-FEC codeword interleaving