Cable Dynamics Problem Statement

- Mechanical movement of a twisted-pair Ethernet physical link can result a time-varying channel response, which in turn can affect physical layer performance.

- Adverse effects include dropping established links and short error bursts associated with cable movement.

- This behavior has been addressed in the 10GBASE-T ecosystem with PHY-based solutions.
  - It is anticipated that 40GBASE-T PHYs can adopt similar solutions
  - Better understanding of the phenomenon may help optimize those solutions

Potential Source of Cable Dynamics Issues

- Industry experience suggests that the phenomenon is related to patch cord movement (not horizontal cabling), and may be related to structural changes in return loss (RL) as the cable is moved.
  - It is believed (but not established by measurement) that the channel elements remain within specification during movement.

- Observed effects are most likely due to a mismatch between the time domain impulse response of the RL at its converged state and the new RL time domain impulse response after movement.

Actions

- Contributions are encouraged to help assess the extent of further study, if any, associated with this phenomenon.
- Possible areas for investigation include:
  - Identifying existing cabling community folklore, specifications, data, and any recommendations for cable movement during equipment operation
  - Characterizing the time-varying channel response of the channel during movement
  - Developing recommendations (if any) for twisted pair patch cords & equipment cords that may include
    - Defining acceptable deflection, bend radius, angle and rate
    - Identifying conditions under which PHY performance should be maintained vs. what is considered to be excessive deflection, bend radius, angle and rate

Summary

- Mechanical movement of a twisted-pair Ethernet physical link can result a time-varying channel response, which in turn can affect physical layer performance.
- The P802.3bq Task Force is seeking to eliminate undesirable performance issues by understanding the time-varying nature of the channel characteristics.
- If the effects can be characterized and appropriate use parameters developed, it is hoped that the phenomenon can be minimized.

Thank You!